

# Exposure to traffic pollution in pregnancy linked to risk of allergies

**A mother's exposure to traffic-related air pollution during the first three months of pregnancy is associated with an increase in her child's risk of having allergic sensitization by age one.**

For babies born to mothers with asthma, the protective effect of breastfeeding is even more pronounced.

These findings from the CHILD Cohort Study (CHILD) were published in the [Journal of Allergy and Clinical Immunology](#) in December 2019.

"This finding supports mounting evidence that traffic-related air pollution (TRAP) exposure in utero can be harmful and is linked to allergic sensitization, which is a risk factor for the development of asthma and allergies later in childhood," says Dr. **Stuart Turvey**, senior author of the paper and Co-Director of CHILD.

The research involved mothers and their children participating in CHILD and used geospatial models of air pollution to determine the level of TRAP the mothers were exposed to during pregnancy. At one year of age, the children underwent skin prick tests to check for allergic sensitization to common food and inhaled allergens.

## FIRST EVIDENCE

The study is the first to provide evidence that a biological marker known as "epigenetic gestational age" (eGA) may be used to understand how TRAP

can change the molecular make-up of a cell to affect the activity of a baby's genes related to asthma and allergy.

"We demonstrated that eGA is in the causal pathway linking air pollution to the risk of developing allergies," explains lead author Dr. **Hind Sbihi**.

"We used cells from the baby's umbilical cord to measure DNA methylation, which are biochemical marks on the DNA and its proteins.

"These marks allowed us to estimate the infant's eGA and compare it to the infant's actual chronological age; when there was a mismatch between the eGA and chronological age related to TRAP exposure, we found there was an increased risk for allergic sensitization."

An analysis estimated that 30% of the association between air pollution and allergic sensitization was mediated by deviations between epigenetic and actual gestational age. The epigenetic work was carried out in the lab of co-author Dr. **Michael Kobor**, a UBC professor and Tier 1 Canada Research Chair in Social Epigenetics.

"Although these proof-of-concept findings need to be studied further, this work is exciting for those of us working in the area of epigenetics," said Dr. Kobor.

"Our results show that the impact of exposure to air pollution can be detected through epigenetic patterns present at birth, and support individual-level and policy-level action to reduce exposure to traffic-related air pollution during pregnancy, hopefully with disease prevention in mind."

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**Higher risk** of allergy if mom breathes in traffic fumes during the first three months of pregnancy

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TRAP can change the molecular make-up of a cell to affect the activity of a baby's genes related to asthma and allergy.

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