

Pollutant exposure may lead to multi-generational asthma risk

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(HealthDay)—Maternal exposure to diesel exhaust particles during

pregnancy may increase susceptibility to allergic asthma in more than one generation of offspring, according to an experimental study published online recently in the *American Journal of Physiology-Lung Cellular and Molecular Physiology*.

David J. Gregory, M.B.B.S., M.P.H., Sc.D., from the Harvard T.H. Chan School of Public Health in Boston, and colleagues compared allergic [susceptibility](#) of three generations of BALB/c offspring after a single maternal [exposure](#) to diesel exhaust particles or concentrated urban air particles during pregnancy. The F1, F2, and F3 offspring were tested in a low-dose ovalbumin protocol for sensitivity to [allergic asthma](#) after receipt of intranasal instillations of particle suspensions or control.

The researchers found that following maternal exposure to particles during pregnancy there was elevated susceptibility, which persisted into F2, and with lesser magnitude, into F3 generations. Elevated eosinophil counts were seen in bronchoalveolar lavage fluid (BAL), histopathologic changes of allergic airway disease were observed, and there were increased BAL levels of interleukin (IL)-5 and IL-13. Distinct DNA methylation changes were identified in F1, F2, and F3 dendritic cells (DCs) using an enhanced reduced representation bisulfite sequencing protocol. The subset of altered loci shared across the three generations was associated with known allergy genes or pathways; some of the genes were linked to chromatin modification.

"The data indicate that pregnancy airway exposure to diesel exhaust [particles](#) triggers a transgenerationally transmitted asthma susceptibility and suggests a mechanistic role for epigenetic alterations in DCs in this process," the authors write.

More information: [Abstract/Full Text](#)

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