

Gene mutations caused by a father's lifestyle can be inherited by multiple generations

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Gene mutations caused by a father's lifestyle can be inherited by his children, even if those mutations occurred before conception. What's more, these findings show that mutations in the germ-line are present in all cells of the children, including their own germ cells. This means that a father's lifestyle has the potential to affect the DNA of multiple generations and not just his immediate offspring. These findings were published in the July 2013 issue of *The FASEB Journal*.

"Our study should be regarded as a pilot study," said Roger Godschalk, Ph.D., a researcher involved in the work from the Department of Toxicology and the School for Nutrition, Toxicology and Metabolism at Maastricht University in the Netherlands. "We hope that our findings support the initiation of new, more elaborate studies that investigate the role of daily life exposures on germ-line mutations transmitted to offspring."

To make this discovery, Godschalk and colleagues looked at two groups of families (father, mother and child) from the Norwegian Mother and Child Cohort Study. The first group had a low yearly income, whereas the second group had a relatively high yearly income. The investigators chose income as a criterion because it generally correlates to lifestyle choices of the parents. For instance, fathers in the low income group were more often [cigarette smokers](#) than fathers in the high income group. Researchers looked for DNA mutations in the children and found that they were more frequent in the group with low income fathers than in the group of high income fathers. These results suggest that the parents living conditions before conception may directly impact the health of their children.

"We've known for a very long time that preventive care among expectant mothers is critical to the

health and well-being of their children," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "Now, we're learning that fathers don't get a free pass. How they take care of themselves—even before conception—affects the genetic makeup of their children, for better or worse."

More information: Joost O. Linschooten, Nicole Verhofstad, Kristine Gutzkow, Ann-Karin Olsen, Carole Yauk, Yvonne Oligschläger, Gunnar Brunborg, Frederik J. van Schooten, and Roger W. L. Godschalk. Paternal lifestyle as a potential source of germline mutations transmitted to offspring. *FASEB J* July 2013 27:2873-2879; [doi:10.1096/fj.13-227694](https://doi.org/10.1096/fj.13-227694)

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