

Stressed dad = depressed children?

Investigating the paternal transmission of stress

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Does Dad's stress affect his unborn children? According to the results of a new study in Elsevier's *Biological Psychiatry*, it seems the answer may be "yes, but it's complicated".

The risk of developing depression, which is significantly increased by exposure to chronic stress, is influenced by both environment and genetics. The interplay of these two factors is quite complex, but in fact, there is even a third factor that most of us know nothing about – epigenetics. Epigenetics is the science of changes in [genetic](#) expression that are not caused by actual changes in DNA sequencing. It is these mechanisms that have been the recent focus of intergenerational investigations into the transmission of stress vulnerability.

Inheritance is complex. We've all known that mothers and fathers have tremendous influence on their children, but "this study highlights how complicated the relationship between genetic, epigenetic, and environmental contributions can be with regards to the inheritance of important behavioral traits," commented Dr. John Krystal, editor of [Biological Psychiatry](#).

Most work to date has focused on maternal effects. In this fascinating new study, researchers investigated paternal effects instead, and found that male mice exposed to [chronic stress](#) pass those stress behaviors along to their offspring. Both their male and female offspring showed

increased depression and anxiety-like behaviors, although the effects were stronger in males. Importantly, these behavioral changes were only present in offspring produced through natural reproduction, and not in those offspring that were produced via in vitro fertilization. That interesting twist suggests that most stress-related vulnerabilities are transmitted to subsequent generations behaviorally, rather than epigenetically.

"This type of translational animal work is important to help scientists focus their work in humans", explained lead author Dr. Eric Nestler, from Mount Sinai School of Medicine in New York. "These findings in mice raise the possibility that part of an individual's risk for clinical [depression](#) or other stress-related disorders may be determined by his or her father's life exposure to [stress](#), a provocative suggestion that now requires direct study in humans."

More information: The article is "Paternal Transmission of Stress-Induced Pathologies" by David M. Dietz, Quincey LaPlant, Emily L. Watts, Georgia E. Hodes, Scott J. Russo, Jian Feng, Ronald S. Oosting, Vincent Vialou, and Eric J. Nestler. Oosting is affiliated with Utrecht University, Utrecht, the Netherlands. The remaining authors are affiliated with Mount Sinai School of Medicine, New York. The article appears in *Biological Psychiatry*, Volume 70, Number 5 (September, 2011), [doi:10.1016/j.biopsych.2011.05.005](https://doi.org/10.1016/j.biopsych.2011.05.005)

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