Medical Xpress

Male mice exposed to chronic social stress have anxious female offspring

August 22 2012

A study in mice conducted by researchers at Tufts University School of Medicine (TUSM) suggests that a woman's risk of anxiety and dysfunctional social behavior may depend on the experiences of her parents, particularly fathers, when they were young. The study, published online in *Biological Psychiatry*, suggests that stress caused by chronic social instability during youth contributes to epigenetic changes in sperm cells that can lead to psychiatric disorders in female offspring across multiple generations.

"The long-term effects of stress can be pernicious. We first found that adolescent mice exposed to chronic social instability, where the cage composition of mice is constantly changing, exhibited anxious behavior and poor social interactions through adulthood. These changes were especially prominent in female mice," said first author Lorena Saavedra-Rodríguez, Ph.D., postdoctoral fellow in the Larry Feig laboratory at Tufts University School of Medicine (TUSM).

The researchers then studied the offspring of these previously-stressed mice and observed that again female, but not male, offspring exhibited elevated anxiety and poor social interactions. Notably, even though the stressed males did not express any of these altered behaviors, they passed on these behaviors to their female offspring after being mated to non-stressed females. Moreover, the male offspring passed on these behaviors to yet another generation of female offspring.

"We are presently searching for biochemical changes in the sperm of

stressed fathers that could account for this newly appreciated form of inheritance" said senior author Larry A. Feig, Ph.D., professor of biochemistry at Tufts University School of Medicine and member of the biochemistry and neuroscience program faculties at the Sackler School of Graduate Biomedical Sciences at Tufts University. "Hopefully, this work will stimulate efforts to determine whether similar phenomena occur in humans."

More information: Saavedra-Rodríguez L, Feig LA. *Biological Psychiatry*. "Chronic Social Instability Induces Anxiety and Defective Social Interactions Across Generations." Available online August 20, 2012. dx.doi.org/10.1016/j.biopsych.2012.06.035

Provided by Tufts University