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Environmental Toxins Passed Down Through Generations

(Ivanhoe Newswire) -- Imagine this: Your great-grandmother was exposed to an environmental toxin while she was pregnant with your grandmother. Now you and your children are suffering consequences like cancer and kidney disease even though you were never exposed to the toxin yourself.

A new study released this week reveals passing down the effects of a toxin through the generations may be possible. Researchers from Washington State University in Pullman, Wash., report when a pregnant animal is exposed to an environmental toxin, it can make the animal and its descendants develop illnesses like cancer and kidney disease for several generations.

Researchers exposed pregnant rats to vinclozolin, a fungicide commonly used in vineyards. Vinclozolin is part of a group of chemicals that interfere with the normal functioning of reproductive hormones. These rats then had male babies with low sperm counts and a high number of adult-onset diseases. When they mated with females not exposed to the toxins, their offspring had the same problems. The pattern continued through four generations. About 85 percent of the offspring in each generation developed conditions such as breast tumors, prostate disease, kidney disease and immune system abnormalities.

"Only the original generation mother was exposed to the environmental toxicant," says Michael K. Skinner from Washington State University. "A human analogy would be if your grandmother was exposed to an environmental toxicant during mid-gestation, you may develop a disease state even though you never had direct exposure, and you may pass it on to your great-grandchildren."

The study shows the potential impact of epigenetic inheritance, the transmission of biological information from parent to offspring that is not encoded in the DNA sequence but instead stems from small chemicals that become attached to the DNA. The genes remain the same but the chemical modifications change the way the genes work.

The study results also show environmental factors may play a much larger role in evolution than once thought.

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