

Dad's preconception fitness regimen may increase obesity, insulin resistance risk in offspring

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Fathers who exercise regularly before their children are conceived may program their offspring's genes with an increased risk for metabolic disorders, according to new research. Alexander Murashov, associate professor of physiology at East Carolina University, will present results of the study at the American Physiological Society's Integrative Biology of Exercise 7 meeting in Phoenix.

Although the link between a mother's preconception activities and the health of her offspring is well-documented, the effects of paternal diet and lifestyle on his progeny are less so. Researchers studied the offspring of male rodents that were exercised for 12 weeks and found that the fathers' [exercise regimen](#) programmed the offspring to be able to burn calories more efficiently, "like [an] energy efficient car which uses less gas to run the same distance," lead author Alexander Murashov said. Instead of a leaner body, however, when fed a high-fat diet the offspring had "increased body weight and adiposity, impaired glucose tolerance and elevated insulin levels," wrote the research team. Researchers analyzed the paternal sperm and found that long-term paternal exercise changed the expression of several metabolic genes and miRNA in the offspring. The effect "may be an adaptive mechanism of changing offspring phenotypic features in response to environmental challenges experienced by fathers," the researchers wrote.

The results were "a total surprise, because our initial hypothesis was that

paternal long-term exercise would decrease risk for obesity in the offspring," Murashov said. The unexpected outcome of the study plays an important role in the future treatment of metabolic diseases in humans. "Identification of epigenetic obesity markers may lead to new diagnostic and therapeutic approaches for the diagnosis and management of [metabolic disorders](#) in children caused by environment that affected their parents," Murashov said.

Provided by American Physiological Society

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