

Gene variants may play role in obesity

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But findings don't explain exactly how they are connected.

(HealthDay)—Two new studies offer some solace to those who can't control their weight despite diet and exercise by providing more evidence that genetics may play a role in obesity.

One study offers unique insight because it finds genetic mutations in severely obese children that suggest their excess weight may be more connected to their DNA because they put on pounds at such a young age. The other study found that certain genetic traits boost the risk of obesity in families.

The exact connection between genes and weight remains elusive. Still, "it's very likely that many of the genetic variants that contribute to weight interact with our environment—the food that we eat and the amount of exercise that we get," said Sadaf Farooqi, professor of

metabolism and medicine at the University of Cambridge in the U.K. and co-author of the study on children. "In fact, some of these genes act by influencing our appetite and how much we like food."

Previous research has shown that certain genetic variations boost the risk of obesity, but not in everyone, said Daniel Belsky, a postdoctoral fellow at Duke University's Center for the Study of Aging and Human Development. "Many people who carry a high load of common genetic risks remain lean while others who carry a light load of common genetic risks develop obesity," he said.

The two new studies, both published in the June 17 issue of the *Journal of Clinical Investigation*, examine variations in the SIM1 gene that are very rare but may have a big effect on the people who have them, Belsky said. "The purpose of studying these variants is to learn something about obesity—what systems are disrupted and how—with the aim of guiding the development of new treatment and prevention strategies," he said.

In one study, researchers found several genetic mutations in 2 percent of 2,100 severely obese kids with an average age of 10, but in fewer than 0.1 percent of the others.

"When the genetic variations do occur, they play a major role in a person's weight," study co-author Farooqi said.

In the other study, researchers studied the DNA of hundreds of children and adults (many of them severely obese), as well as the DNA of children who seem to have a condition called Prader-Willi syndrome, which can lead to overeating and out-of-control obesity. Led by a researcher from the Lille Pasteur Institute in France, the study authors linked three genetic mutations—related to those in the other study—to a high risk of obesity in families.

Scientists suspect that the genetic variations in the studies affect hunger and the way the body handles energy.

What can people do if their genes put them at higher risk of obesity? For now, nothing beyond trying the usual weight-loss strategies, such as diet, exercise and surgery.

"Despite this new discovery, there are still many genes to be found and we still don't understand how some of these genes actually work to affect our weight over long periods of time," Farooqi said. "If we can find new genes and understand how they work, we may be able to find more appropriate treatments for people who struggle with their weight."

More information: For more about [obesity](#), try the U.S. National Library of Medicine.

Rare variants in single-minded 1 (SIM1) are associated with severe obesity, *J Clin Invest.* [doi:10.1172/JCI68016](https://doi.org/10.1172/JCI68016)

Loss-of-function mutations in SIM1 contribute to obesity and Prader-Willi-like features, *J Clin Invest.* [doi:10.1172/JCI68035](https://doi.org/10.1172/JCI68035)

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