

Scientists find how obesity gene works and raise hope for new treatment

By Associated Press, adapted by Newsela staff on 09.24.15

Word Count **862**



Like many people, Lauren Brush works out regularly in an effort to slim down. Researchers are looking at many other factors that may contribute to weight gain. Photo: Terrence Antonio James/Chicago Tribune/MCT

More than one-third of adult Americans are considered to be very overweight, or obese. Scientists have now figured out how a key gene tied to obesity makes people fat. The discovery could open the door to an entirely new approach to the problem, beyond diet and exercise.

The work solves a big mystery. Since 2007, researchers have known that a gene called FTO was related to obesity. They did not know how, though, and they could not tie it to appetite or other known factors.

Now experiments reveal that a flawed version of the gene causes energy from food to be stored as fat rather than burned. Genetic studies on mice and on human cells in the lab suggest this can be reversed. Scientists hope that a drug or other treatment might be developed to do the same in people.

The work was led by scientists at MIT and Harvard University and published online Wednesday by the New England Journal of Medicine, a magazine for doctors and scientists.

Gene Plays A Part, Like Diet Or Exercise

For a long time people believed "when people get obese it was basically their own choice because they choose to eat too much or not exercise," said Melina Claussnitzer, the leader of the study and a genetics expert at the Beth Israel Deaconess Medical Center. She also said the genetic discovery has revealed another factor in how people become obese that was not suspected before. It's like a third explanation for the causes of obesity, after diet and exercise.

Independent experts praised the discovery.

"It's a big deal," said Dr. Clifford Rosen, a scientist at Maine Medical Center Research Institute and an editor at the medical journal.

"A lot of people think the obesity epidemic is all about eating too much," but our fat cells play a role in how food gets used, he said. With this discovery, "you now have a pathway for drugs that can make those fat cells work differently."

Much Research Still Needed For Any Drug

Several obesity drugs are already on the market. They are generally used for short-term weight loss. The drugs target the brain to reduce a person's appetite. Metabolism, the body's process of converting food and drink into energy, is not targeted.

The new findings are exciting. Still, it will be awhile before any kind of new weight loss drug or treatment is made available. Besides, it's unlikely it would be a magic pill that would enable people to eat anything they want without gaining weight. Targeting this fat pathway could affect other parts of the body in negative, unforeseen ways. For that reason, any treatment would need strict testing to prove it was safe and effective.

The flawed gene doesn't explain all obesity. While it was found in just under half of all Europeans tested, it was found in only 5 percent of black people tested. So other genes clearly are at work. Food and exercise still matter.

Flawed Gene Affects Use Of Calories

Having the flawed gene does not destine you to become obese, but it may make it more likely. Genes come in pairs. People with two copies of the gene (one from Mom and one from Dad) weighed an average of 7 pounds more than those without them. Some, however, were obviously a lot heavier than that, and even 7 pounds can be the difference between a healthy and an unhealthy weight, said Manolis Kellis, a professor at MIT.

He and Claussnitzer are seeking a patent related to the work. It was done on people in Europe, Sweden and Norway, and funded by the German Research Center for Environmental Health and others, including the U.S. National Institutes of Health.

Obesity affects more than 500 million people worldwide. The problem contributes to a host of diseases.

The FTO gene turns out to influence obesity indirectly. It affects two other genes that control thermogenesis, or burning off energy. Scientists have known for a long time that brown-colored fatty tissue — the so-called "good fat" — burns calories from food and drink. The more common white fat stores them. The body constantly makes fat cells, and the two genes determine whether they become brown or white ones. The FTO gene acts like a switch, affecting the brown and white fats.

Effects Studied In Mice, Human Cells

In one experiment described in the medical journal, researchers blocked the damaged gene's effect in mice. They found the mice became 50 percent leaner than other mice, despite eating a high-fat diet, and burned more energy even when asleep.

In other tests on human cells, blocking the gene's effect increased energy burning in fat cells. Another test in the lab edited out the problem gene in human cells. This made the metabolism work normally.

Researchers do not know the effect of having just one flawed copy of the gene. They think it probably has less of an effect than having two copies.

Several companies are trying to develop treatments to encourage the growth of calorie-burning brown fat.

Dr. Sam Klein is an obesity researcher at Washington University in St. Louis. He called the work "an amazing study" and "a scientific tour de force."

Quiz

- 1 Does the following detail from the article support its central idea? Why or why not?

For a long time people believed "when people get obese it was basically their own choice because they choose to eat too much or not exercise," said Melina Claussnitzer, the leader of the study and a genetics expert at the Beth Israel Deaconess Medical Center.

- (A) Yes, because it explains why one-third of American adults deal with obesity, despite prior beliefs.
- (B) Yes, because it explains prior beliefs about obesity, which have been partly disproved by new research.
- (C) No, because this information contradicts the new research about the faulty FTO gene, due to Claussnitzer's study.
- (D) No, because it does not explain how the new research challenges the belief that people are responsible for their obesity.
- 2 Which of the following sentences is a personal opinion that does not belong in an objective summary of the article?
- (A) The discovery could open the door to an entirely new approach to the problem, beyond diet and exercise.
- (B) Genetic studies on mice and on human cells in the lab suggest this can be reversed.
- (C) For a long time people believed "when people get obese it was basically their own choice because they choose to eat too much or not exercise," said Melina Claussnitzer, the leader of the study and a genetics expert at the Beth Israel Deaconess Medical Center.
- (D) (Dr. Sam Klein) called the work "an amazing study" and "a scientific tour de force."

3 Which phrase in the paragraph below is used figuratively?

More than one-third of adult Americans are considered to be very overweight, or obese. Scientists have now figured out how a key gene tied to obesity makes people fat. The discovery could open the door to an entirely new approach to the problem, beyond diet and exercise.

- (A) considered to be overweight
- (B) a key gene tied to obesity
- (C) open the door
- (D) a new approach

4 Which of the following answer choices has the SAME meaning as the word "unforeseen" in the first sentence below?

Targeting this fat pathway could affect other parts of the body in negative, unforeseen ways. For that reason, any treatment would need strict testing to prove it was safe and effective.

- (A) harmful
- (B) unknown
- (C) dangerous
- (D) unsuccessful