

Mammoth Mice: What lab rodents are teaching us about obesity

By KATELYN S. CROW

The United States' reputation as one of the fattest countries in the world may be due to more than lack of exercise and poor eating habits. Scientists in the University of Florida's College of Pharmacy are working to understand how genetics may play a role in causing obesity.

"We work on a lot of different projects, but the overarching theme is that we want to understand what protein signals in the brain make an individual want to eat or not want to eat and how that relates to obesity," said Carrie Haskell-Luevano, associate professor in the department of medicinal chemistry.

Haskell-Luevano and her research team are studying mice to better understand human feeding behaviors. The studied mice are referred to as "knockout mice" because they have had a gene inactivated or "knocked out" that results in extreme obesity.

The deleted gene normally produces a hormone in the brain called melanocortin that serves to let an organism know when it is full or not. Without the gene to produce melanocortin, the organism never feels full.

"In the knockout mouse, the heart is completely encased in fat," Haskell-Luevano said. "It makes one wonder how the heart is able to beat if it is surrounded by such a fat mass."

After the research using knockout mice, scientists turned their attention to morbidly obese humans and discovered many of these individuals exhibited the genetic glitch that "knocked out" one of their genes, Haskell-Luevano said.

Those with such a genetic glitch are not destined to become morbidly obese. Studies show that knockout mice that participated in voluntary exercise at a young age can prevent this genetic defect from ever displaying itself in obesity, Haskell-Luevano said.

The same concept applies to humans.

Exercise at a young age can prevent a number of childhood obesity-related issues and diabetes, Haskell-Luevano said. However, as observed in mice, obesity will return in the absence of exercise.

"If we put them [knockout mice] in a cage with no wheel, they returned back to their obese size, eating two to three times more than the normal mice," Haskell-Luevano said.

Individuals who are already classified as morbidly obese can expect various treatments ranging from daily pills to gene therapy.

"The idea that having a gene defect causes somebody to be obese is relatively new. Now insurance companies recognize obesity as a disease and not the inability of an individual to control themselves," Haskell-Luevano said.



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The Skinny on Sunbathing

University of Florida scientists are discovering that the myth of decreased hunger while exposed to the sun might actually be closer to reality.

Carrie Haskell-Luevano, University of Florida associate professor in the department of medicinal chemistry, is working to understand how a suntan can make an individual feel full with little to no actual food intake.

"We study how proteins and hormones in the brain interact with other hormones one's body makes," Haskell-Luevano said.

When the hormone melanocortin was discovered in the 1960s, little was known except that the hormone was involved in the change skin color undergoes after prolonged exposure to the sun.

Research in the 1990s discovered melanocortin is found in the brain and is released when tanning occurs. Haskell-Luevano said the hormone makes a person feel full and not want to eat.

This research gives plausibility to the claim that sunbathing causes an individual to temporarily lose the desire to eat.

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Produced by the Scientific Thinking & Educational Partnership program at UF

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