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HEALTH

FAT CAN BURN ITSELF, SAY SCIENTISTS IN WEIGHT-LOSS BREAKTHROUGH

Initial trials indicate the body can be 'tricked' into turning calorie-storing white fat cells into calorie-burning beige

Who doesn't wish for an easier weight-loss journey? It can be tricky to make those all-important changes to improve our diet and exercise, and trickier still to know which of the endless weight-loss fads will be the one to work for you. Of course, there is no substitute for healthy eating and regular exercise, but scientists might have found something of a cheat code for burning calories. And it all comes down to a fat-burning mechanism that you already have in your body. It's known as beige fat.

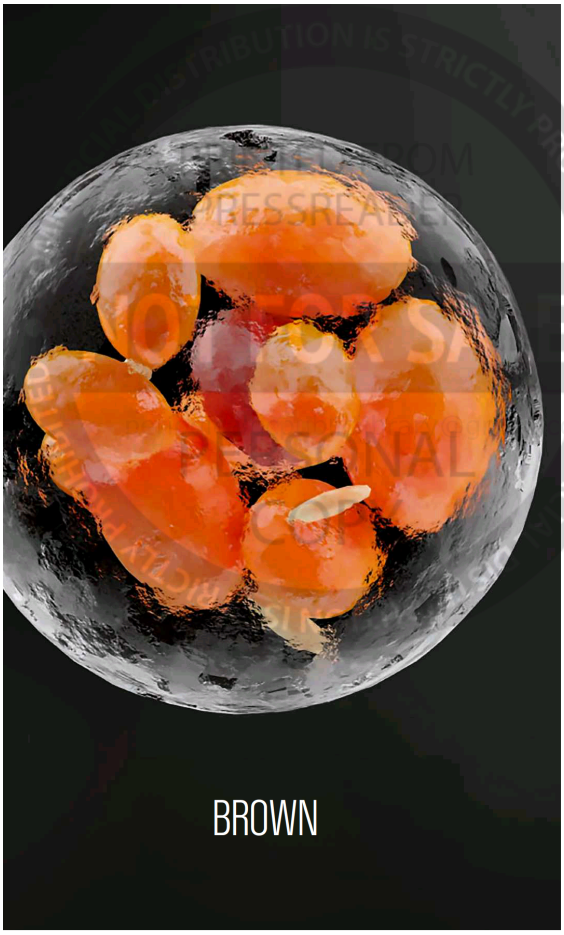
Lots of mammals, including humans, have three types of fat cells: white, brown and beige. A team of researchers at the University of California, San Francisco, USA, have discovered a way of getting white fat cells to transform themselves into beige.

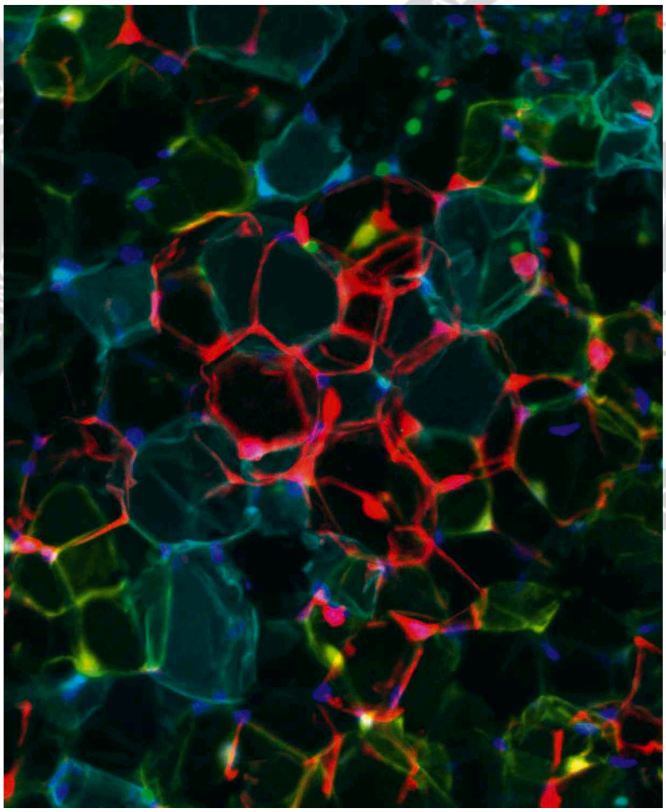
Now, it would be understandable to think that these sound like two sides of the same coin, but there is a significant difference. White fat cells store calories for energy, brown cells burn energy to release heat in the regulation of body temperature, and beige cells combine both tasks.

By switching more white fat cells into beige – which, unlike brown, are embedded in deposits of white fat – the body could effectively burn more fatty cells naturally, without assistance.

While this discovery is based on tests on mice, the researchers are optimistic that it could lead to the development of a new class of weight-loss drug, and one without the side effects in some of the current treatments growing in popularity today. It could even explain why clinical trials of related therapies have not been successful to date.

Humans can naturally transform white fat cells into beige in certain circumstances, like a diet or a cold environment, but scientists have long believed that the key to inducing this process lies with stem





GETTY IMAGES, LIANG LI

ABOVE LEFT Of the three types of fat cell found in humans, brown and beige cells burn fat to generate heat

ABOVE White fat cells act as an energy reserve, making them difficult to get rid of when losing weight

"The team bred mice with white fat cells lacking the KLF-15 protein, and found that they converted fat cells from white to beige"

cells. The new study, published in the *Journal of Clinical Investigation*, demonstrated that there is another method that does not rely on stem cells at all. Ordinary white fat can transform into beige fat by limiting the production of a single protein: KLF-15.

"A lot of people thought this wasn't feasible," said Dr Brian Feldman, professor of paediatric endocrinology and senior author of the study. "We showed not only that this approach works to turn these white fat cells into beige ones, but also that the bar to doing so isn't as high as we'd thought."

KLF-15 plays a role in metabolism and the function of fat cells. During investigations on mice, Feldman and his team discovered that the protein was much less abundant in white fat cells than the other two.

The team bred mice with white fat cells that lacked the KLF-15 protein, and found that they converted fat cells from white to beige. Not only could they make that switch, but, without the protein, beige actually became the default setting.

The reason for this – discovered using cultured human fat cells – is that KLF-15 controls the levels of a receptor called Adrb1, which helps to maintain energy balance. Previous research used drugs to target the similar Adrb3 receptor in mice, and resulted in the test subjects losing weight. Human trials, however, had disappointing results.

According to the team, a drug targeting the Adrb1 receptor is much more likely to be effective. It could also have advantages over current weight-loss treatments by limiting the side effects while having longer-lasting benefits.

"For most of us, white fat cells are not rare and we're happy to part with some of them," said Feldman. "We're certainly not at the finish line, but we're close enough that you can clearly see how these discoveries could have a big impact on treating obesity."