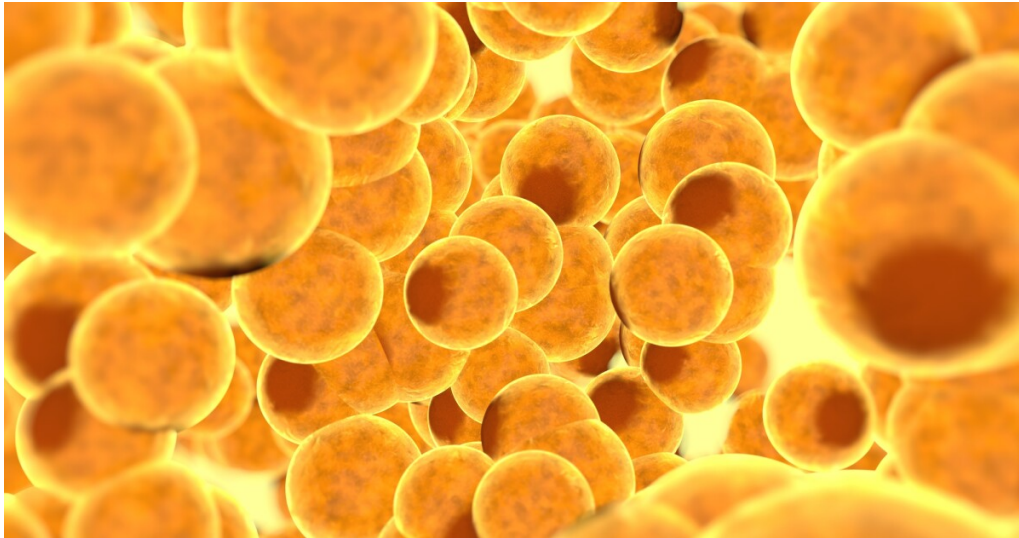


Science

Hydrogel injected into the fat store fights obesity from the inside

kriskaito · 17 hours ago



There are many forms of next-generation treatments to combat obesity, but the Nanyang Technological University example, which uses a unique combination of light and metabolic functions to break down fat, has some unique benefits. The team's solution consists of hydrogels that can be injected into fat deposits and exposed to near-infrared light, and obese mice show up to 54% fat loss after treatment.

The function of this new technology relies on a protein called TRPV1 that plays an important role in our metabolism. This protein can trigger the conversion of white fat, which stores excess calories in the belly of beer and the handle of love, into brown fat. This is the type of fat that the body burns quickly for energy and warmth, and therefore [Anti-obesity research](#) The focus is on therapies that can initiate this transformation.

TRPV1 activity also promotes the breakdown of lipid droplets into fatty acids. Fatty acids can be used by the converted brown fat to burn calories, or they can be broken down in the bloodstream through a process called lipolysis. In addition, this protein stimulates hormone secretion, improving glucose and lipid metabolism in the liver and muscles, as well as improving insulin sensitivity.

Researchers have begun developing treatments targeting TRPV1 with hydrogels containing copper sulfide nanoparticles that activate proteins in response to light

and FDA-approved drugs that can stimulate adipose tissue browning, created. A biocompatible polymer was also added to keep the hydrogel gelled after injection and slowly released its contents over several days.

Obese mice characterized by metabolic disease were injected with hydrogel into subcutaneous fat and the injection site was irradiated with near-infrared light for 5 minutes. This was done for 3 days daily for 2 weeks, then rested for 4 days, resulting in a 5.5% decrease in animal weight compared to the 9.5% increase seen in the control group. Treated mice also showed a 40% reduction in subcutaneous fat, a 54% reduction in visceral fat, a 54% reduction in cholesterol, and a 65% reduction in insulin resistance.

“Experiments in the laboratory have shown that this approach not only reduces fat in obese mice by 40-54%, but also significantly improves metabolism. It is heart disease, stroke, type 2. It’s the key to reducing the risk of metabolic conditions such as diabetes. Type 2 diabetes. ” “This method uses the heat converted from near-infrared light to burn subcutaneous fat, but no burns to the skin were found.”

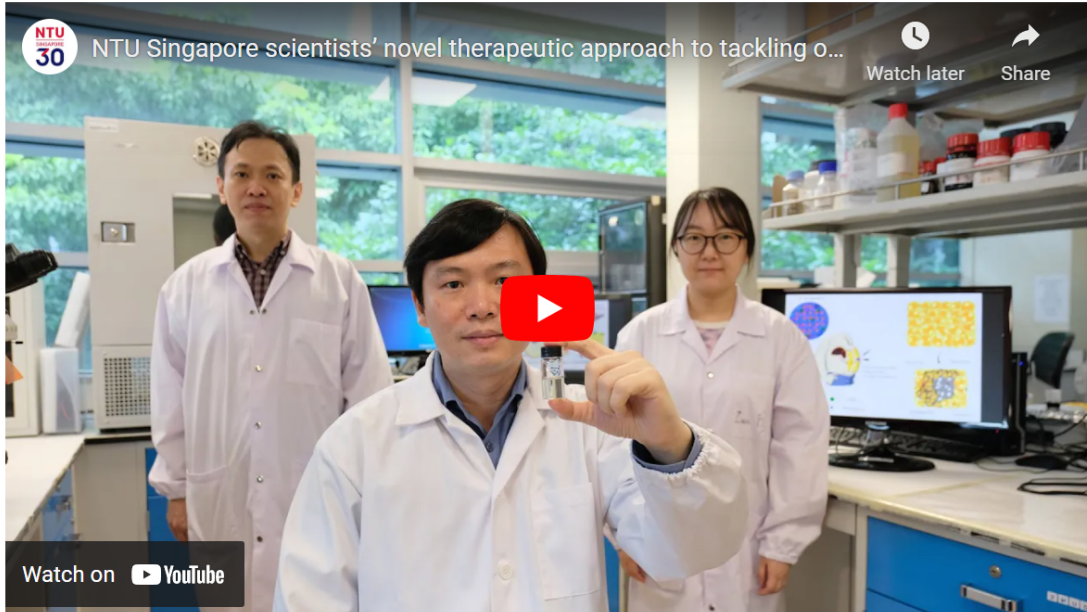
Scientists still have a lot to do to translate these promising results into treatments to address obesity and metabolic dysfunction in humans. However, early signs indicate that it may fill the gap in existing treatments for these conditions, which carry the risk of side effects or are exorbitantly expensive.

“All FDA-approved obesity treatments act indirectly on the brain to suppress appetite and on the digestive system to reduce fat absorption,” Peng said. “Most of them have withdrawn from the market due to serious side effects. The procedures performed in the clinic to remove fat in the target area have been shown to be effective, but at risk and high cost. In contrast, our therapeutic approach focuses on the remodeling of white adipose tissue, the root of evil. ”

To see what the treatment looks like, scientists have found that obese patients self-administer hydrogels at home, irradiate the site with a portable laser to activate copper sulfide particles, and then activate the TRPV1 protein. I imagine I can do it. The team has applied for a patent for this technology and is currently looking for a partner to conduct clinical trials in human patients.

The study was published in the journal *ACS Nano*. The video below provides an overview of the study.

NTU Singapore scientists' novel therapeutic approach to ...



NTU Singapore Scientists' New Therapeutic Approach to Obesity Efforts

Source: Nanyang Technological University

<https://newatlas.com/medical/hydrogel-injected-fat-stores-obesity/> Hydrogel injected into the fat store fights obesity from the inside