

Activating brown fat could be a healthy solution for weight loss

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Abstract

Obesity is a sign of our times. It has various causes, including lack of exercise, laziness and a high-carbohydrate diet. Fortunately, there is a physiological way to lose weight: it is the activation of brown fat. This fat is designed by nature to generate warmth or heat and burn or consume calories in the process. The trigger for this is exposure to coolness and cold. Several methods exist for this purpose, the most effective of which is spending a few minutes in a cold chamber (cryotherapy). There are now a number of scientific studies that prove that this mechanism should be integrated into the weight loss routine.

Introduction

Brown fat, also known as brown adipose tissue (BAT), is a fascinating type of fat that plays a unique role in our bodies. Brown fat is distinct from the more common white fat that accumulates around our belly, hips, and thighs. Unlike white fat, which primarily stores energy, brown fat is like an energy-burning powerhouse. It generates heat by burning calories. Brown fat cells contain more mitochondria, the cellular structures which are responsible for ATP energy production within the Citric acid cycle.

Activation of Brown Fat: Scientists have recently mapped the precise nerve pathways that activate brown fat [1]. Low temperatures act as the "on switch" for brown fat, helping our bodies maintain warmth and burn calories in the process. Researchers at the UCLA School of Medicine dissected human cadavers to trace sympathetic nerve branches leading to the brown fat depot near the collarbone [2]. These nerves connect to regions controlling sensation in the face, head, neck, and shoulders, as well as the diaphragm. Altering this nerve supply could potentially lead to new treatments for obesity and related metabolic conditions [3,4]. Activating brown fat can be beneficial for everyone's overall health and potentially aid in weight management. Some strategies for that purpose are.

Cold Exposure: Cold temperatures stimulate brown fat activity. When someone is exposed to cold, the body activates brown fat to generate heat and maintain warmth. Similar possibilities are cold showers, spending time outdoors in cooler weather, or even using ice packs on specific areas (like the neck, upper back, hands) to encourage brown fat activation.

Physical activity: Exercise plays a role in activating brown fat. Regular physical activity, including both aerobic exercises (like jogging or cycling) and strength training are aids. High-intensity

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interval training (HIIT) may be particularly effective in activating brown fat.

Sleep quality: Good sleep is necessary for all metabolism. Poor sleep can negatively impact brown fat function. Hence, one should aim for 7-9 hours of quality sleep each night.

Healthy diet: Certain foods and nutrients may influence brown fat activity. One should consider the following: Capsaicin: Found in spicy foods like chili peppers, capsaicin may boost brown fat activity. Green Tea: Green tea compounds (catechins) can enhance brown fat function. Omega-3 Fatty Acids: These healthy fats, found in fish and flaxseed, may support brown fat activation. Hydration: Staying hydrated is essential, dehydration can reduce brown fat activity.

Caloric restriction and avoiding overeating may help activate brown fat. Intermittent fasting or time-restricted eating patterns can be beneficial. Mindfulness and stress reduction: Chronic stress can negatively impact brown fat. Perhaps one should practice meditation or relaxation techniques to manage stress.

Medications and brown fat activity: Some medications, such as semaglutide (Ozempic, Wegovy) and tirzepatide (Mounjaro), may impact brown fat activity. These drugs belong to a class called glucagon-like peptide-1 (GLP-1) receptor agonists (5,6). They work by mimicking the hormone GLP-1, which is released in the gut and brain in response to eating glucose (sugary foods or drinks). While the evidence is still debated, GLP-1 agonists have been shown to increase brown fat activity in both rodents and humans, but likely indirectly, via activation of specific regions in the brain, explained Varman Samuel, MD, PhD, an associate professor of medicine at the Yale School of Medicine, and chief of endocrinology for the VA Connecticut Healthcare System [7].

Cold chamber : Can it activate the brown fat and induce weight loss?: Indeed, staying in a cold chamber can activate brown fat and potentially contribute to weight loss. Cold chambers (also known as cryotherapy chambers) are specialized enclosures where individuals are exposed to extremely cold temperatures for short durations. Cryotherapy sessions typically last a few minutes only. During this time, the body responds by activating brown fat and increasing metabolic activity.

In Russia, it is a popular sport to go into water that is around zero degrees Celsius in winter and stay there for a few minutes. This is said to boost the body's resistance, especially the immune system. In Finland, people also go into cold water after having been in the sauna.

Beyond weight loss, cold exposure and brown fat activation offer other potential benefits: Improved Insulin Sensitivity: Brown fat may enhance insulin sensitivity, which is crucial for managing blood sugar levels. Enhanced Cardiovascular Health: Cold exposure may improve circulation and cardiovascular function. Reduced Inflammation: Some research indicates that cold exposure may reduce inflammation.

Regular exposure to cold environments: Caloric Expenditure: Activated brown fat increases the overall caloric expenditure. By burning more calories, the body may tap into stored fat reserves, potentially aiding in weight loss. Optimal temperature for brown fat activation: The range typically falls between 14°C to 17°C. At these temperatures, the body activates brown fat to generate heat and maintain warmth.

A process the body uses to stay warm in cool weather could one day lead to new therapies for obesity. Greenland and Alaska inuit who live in a cold environment have more brown fat than white people [8].

Scientists have, for the first time, mapped the precise nerve pathways that activate brown fat, or brown adipose tissue (BAT), a specialized fat that generates heat. Low temperatures kick brown fat into gear, helping the body keep its temperature and burning calories in the process.

“It has long been speculated that activating this type of fat may be useful in treating obesity and related metabolic conditions,” said Preethi Srikanthan, MD, an endocrinologist and professor of medicine who oversaw the research at the UCLA School of Medicine [9].

After dissecting the necks of eight human cadavers, Srikanthan and her team traced the sympathetic nerve branches in the fat pad above the collarbone – where the largest depot of brown fat in adults is stored. They stained the nerves, took samples, and viewed them under a microscope. They found that nerves leading to brown fat traveled from the third and fourth cervical nerves of the spine, nerves that give sensation to parts of the face, head, neck, and shoulders and that help control the diaphragm.

In a previous case study, damage to these nerves appeared to block a chemical tracer from reaching brown fat. The evidence suggests that changing this nerve supply could alter brown fat activity, potentially leading to new treatments for obesity and metabolic diseases like type 2 diabetes, Srikanthan said.

Opening the door to future obesity treatments: Her discovery means other new treatments could be on the horizon. Previous research had shown that the sympathetic

nervous system, which controls your body's stress response, drives brown fat activity. But now that the UCLA scientists have revealed the exact nerves connecting brown fat to the sympathetic nervous system, we find ways to stimulate those pathways to activate brown fat – without stimulating the many organs (such as the heart and stomach) also connected to this vast network of nerves, Srikanthan wrote.

Summary: In summary, brown fat is not a typical fat—it is a calorie-burning ally that could hold promise for weight loss and metabolic health. In particular, it should be emphasized that it is a gentle, relatively comfortable and natural method. It works together with the physiology of the organism. However, no effects can be expected after a single application; it requires a series of exposures over a period of time. The impatience with which obese people today want to lose weight quickly is counterproductive. However, the fast-acting methods have side effects and there is often a rebound or yo-yo effect. It is therefore advisable for obese people to take the cold application into consideration [10].

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