

Skin Patch for Combating White Fat Development

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Technology description

Combat the development of white adipose tissue while simultaneously stimulating beige adipose tissue development for the reduction of unwanted fat.

Utilization of a patch aimed to show a reduction in treated fat pad size, increase whole body energy expenditure, and improve type-2 diabetes in vivo in a diet-induced obesity mouse model. Additionally, this patch aims to respond to physiological signals to deliver the necessary amount of drug to most efficiently combat fat.

Background

As of 2016, the cost of obesity-related medical treatments was ~\$210 billion/year in the US alone. With the obesity epidemic on the rise, the need for effective treatments is extremely important. Adipocytes/fat-cells can be classified into 3 types: brown, beige and white. The brown and beige adipocytes have been shown to dissipate energy in the form of heat and offer a new way to battle obesity and its associated disorders. Studies conducted on rodents showed that activation of brown & beige adipocytes helped combat obesity & other related metabolic diseases.

The brown/beige adipocyte have also been shown to exist in humans at various ages, and the activated human brown and beige adipocytes have a therapeutic potential against obesity and diabetes.

Administration of β 3-adrenoceptor agonists activates brown/beige adipocytes and promotes energy expenditure. However, traditional β 3-adrenoceptor agonists such as CL316, 243, L-796568, TAK-677 were not approved for use in clinical trials due to multiple side effects including increased heart rate. Thus, there is a present need for alternate technique to combat obesity in a healthy and effective manner.

Technology Description

Researchers at the University of New Mexico have developed the idea of an innovative skin patch that can combat the development of white adipose tissue while simultaneously stimulating beige adipose tissue development to reach the final goal of fat loss and reducing an abundance of unwanted fat in certain areas. The patch is aimed to show a reduction in treated fat pad size, increase whole body energy expenditure, and improve type-2 diabetes in vivo in a diet-induced obesity mouse model.

Additionally, this patch aims to respond to physiological signals to deliver the necessary amount of drug to most efficiently combat fat.

Publications

[Adipose mTORC1 Suppresses Prostaglandin Signaling and Beige Adipogenesis via the CRTC2-COX-2 Pathway](#)

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Application area

A transcutaneous browning agent patch to locally induce white-to-beige adipose tissue transformation
The patch is set to be capable of effectively delivering browning agents to the subcutaneous adipocytes in a sustained manner and switch on the “browning” at the targeted region
Provides weight loss and reduces an abundance of unwanted fat in certain areas in an effort to combat obesity and diabetes

The fast response of the cells to this technology holds great potential in avoiding hyperglycemia and hypoglycemia once translated effectively for human therapy

Applications as a therapeutic treatment of obesity and other related metabolic disorders

Institution

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