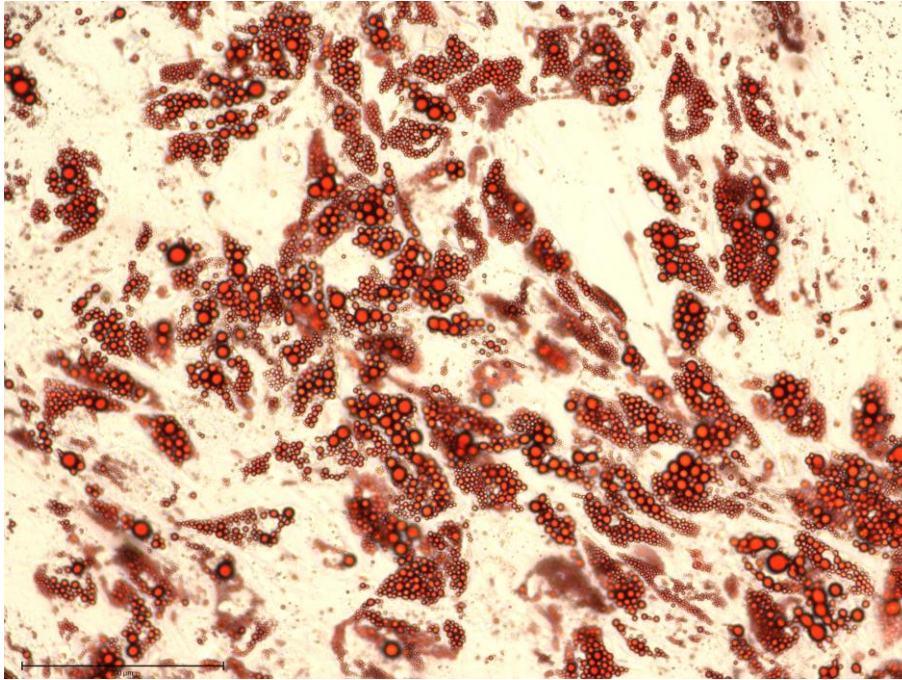


RWTH Technology

ITIH5 for use in the treatment of obesity



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Fields of application

Obesity, metabolic syndromes

Keywords

#ITIH5; #Obesity; #weight gain

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Challenge

In obesity, adipose tissue becomes dysfunctional and expands improperly to store excess energy. Therein, fat mass expansion is the result of excessive lipid accumulation (see picture of stained lipid vacuoles from developing adipocytes), which occurs by volume enlargement of adipocytes (hypertrophy) and/or by increasing adipocyte numbers (hyperplasia). Moreover, obesity and the associated metabolic disorders are one of the major health challenges worldwide. In the last 20 years, the obesity rate (people with a BMI of more than 30) has risen from 31 % in 1999 to 42 % in 2020. Obesity is known to be a strong risk factor for type 2 diabetes mellitus, cardiovascular disease, hypertension, atherosclerosis and stroke. About 2.8 million people die every year as a result of overweight and obesity. Worldwide, the annual treatment costs for this group of diseases amount to 150 billion US dollars, which clearly demonstrates the need for improved treatment options.

Solution

One way to treat obesity is through therapeutic drugs. For this reason, researchers worldwide are working intensively on the characterization of new targets that could be helpful in treatment of overweight and obesity. The present invention discloses the protein Inter-alpha-Trypsin Inhibitor Heavy Chain 5 (ITIH5) as a novel adipokine that can regulate adipose tissue homeostasis by inhibiting the proliferation (hyperplasia) and adipogenic differentiation (hypertrophy) of human adipose precursor cells (APCs). Furthermore, ITIH5 exerts a strong anti-inflammatory activity on cells in adipose tissue. So far, ITIH5 has only been described as a tumor suppressor protein in various solid tumors such as breast and pancreatic cancer. In addition, ITIH5 acts as a natural stabilizer for hyaluronic acid (HA) and modulates biological processes during skin repair. In this invention, ITIH5 was found to have properties that can be used for the treatment of obesity and metabolic diseases.

Advantages

- ITIH5 polypeptide is naturally produced of the body → no immune reaction is expected
- ITIH5 inhibits the proliferation of adipose precursor cells (APCs), this effect may reduce the amount of adipose tissue in a treated subject

- ITIH5 inhibits the adipogenesis of adipose precursor cells (APCs), this effect may also reduce the amount of adipose tissue in a treated subject
- ITIH5 downregulates the secretion of inflammatory mediators, this effect may restore the functionality of adipose tissue in a treated subject

Status

- Patent application at the German Patent and Trademark Office. Patent application not yet disclosed. RWTH Aachen University cannot derive any rights against third parties from the patent application, which has not yet been disclosed.
- Development status: Proof of concept and ongoing research.
- First publication online available: <https://pubmed.ncbi.nlm.nih.gov/38095340/>

RWTH Aachen University is looking for partners for patent exploitation or research partners for development cooperation.