

Control of blood vessels a possible weapon against obesity

7 January 2009

Mice exposed to low temperatures develop more blood vessels in their adipose tissue and metabolise body fat more quickly, according to a new study from Karolinska Institutet. Scientists now hope to learn how to control blood vessel development in humans in order to combat obesity and diabetes.

Chen, Helena M Feldmann, Zicai Liang, Zhengping Zhu, Jan Nedergaard, Barbara Cannon, Yihai Cao, *Cell Metabolism*, 6 January 2009.

Source: Karolinska Institutet

The growth of fat cells and their metabolism depend on oxygen and blood-borne nutrients. A possible way to regulate the amount of body fat - in order, for instance, to combat obesity - can therefore be to affect the development of blood vessels in the adipose tissue.

A team of researchers at Karolinska Institutet have now demonstrated the rapid development of blood vessels in the adipose tissue of mice exposed to low temperatures. This is followed in its turn by a transformation of the adipose tissue from 'white' fat to 'brown' fat, which has higher metabolic activity and which breaks down more quickly.

"This is the first time it's been shown that blood vessel growth affects the metabolic activity of adipose tissue rather than vice versa," says Professor Yihai Cao, who led the study. "If we can learn how to regulate the development of blood vessels in humans, we'd open up new therapeutic avenues for obesity and metabolic diseases like diabetes."

Brown fat releases heat when it breaks down, and is mainly found in hibernating animals. In humans, it is found in newborn babies, but scientists believe by controlling blood vessel development that it might be possible to transform white fat to brown fat in adults as well.

Publication: "Cold triggers VEGF-dependent but hypoxia-independent angiogenesis in adipose tissues and anti-VEGF agents modulate adipose tissue metabolism", Yuan Xue, Natasa Petrovic, Renhai Cao, Ola Larsson, Sharon Lim, Shaohua

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