

Cholesteryl ester transfer protein (CETP) enhances interscapular brown adipose tissue (iBAT) temperature and induces a greater increment in iBAT mass when exposed to cold.

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Abstract

Cholesteryl ester transfer protein - CETP - is a plasma protein that mediates the exchange of triglycerides for esterified cholesterol from HDL to the apoB containing lipoproteins. In this way, CETP promotes reduction of plasma HDL-cholesterol and, thus, increases the risk of atherosclerosis. Recently, we identified a new role for CETP, in that CETP may modulate adiposity. Previous data from our group shows that CETP expression reduces adipose tissue mass (~30%) and leptinemia (40%), what cannot be explained by differences in fat intake or excretion. The effect on adiposity is explained by increased lipolysis rates and whole body energy expenditure - EE- (50 and 10%, respectively). Here, we show that CETP expressing transgenic mice have similar spontaneous activity, and citrate synthase activity (mitochondria number marker) is not increased in liver, muscle and iBAT. Although rectal temperature is reduced in CETP group, the iBAT temperature was increased (more than 1°C). Moreover, cold exposure (4 °C) for 10 days increased iBAT mass 15% more in CETP group than in NTg group. During this period, growth and food intake were similar between groups. These findings suggest that the increase in EE in CETP expressing mice might be due to interscapular brown adipose tissue (iBAT) activity, what leads to the adiposity reduction effect of CETP.

Key words: CETP, adiposity, BAT

Introduction

The aim was to investigate what tissue contributes to the increase in EE and reduction of adiposity in CETP expression.

Results and Discussion

Five month old female mice expressing simian CETP (sCETP) and non transgenic (NTg) littermates fed with chow diet were compared.

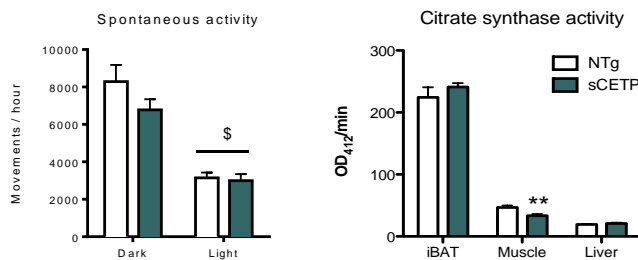


Image 1. Spontaneous activity (n=6) and citrate synthase activity (n=6-7) of NTg and CETP transgenic mice. Student' t test: \$ dark vs light p<0.0001; ** NTg vs sCETP p=0.01

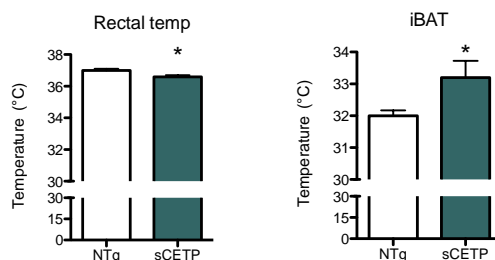


Image 2. Rectal (n=19-24) and iBAT (n=7-10) temperatures of NTg and CETP transgenic mice. Student't test: * NTg vs sCETP p=0.05

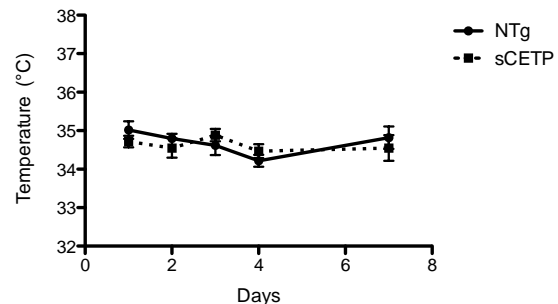


Image 3. Mice rectal temperature during cold exposure (4 °C, 10 days) (n=6). Student' t test: * NTg vs sCETP p=0.05

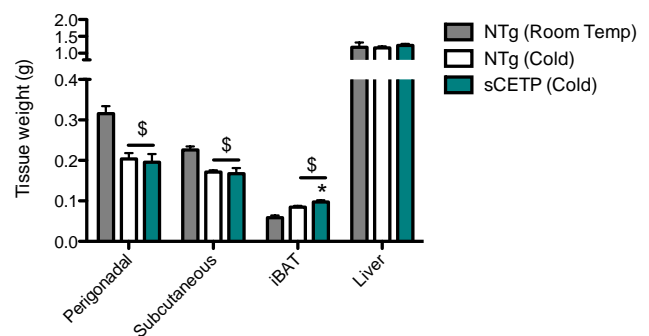


Image 4. Tissue weight after cold exposure (4 °C, 10 days). (n=2-6). Student't test: \$ room vs cold temp p<0.005; * NTg vs sCETP p=0.05

Conclusions

CETP expression increases iBAT temperature and cold induced increment of iBAT mass, what may explain the increase in energy expenditure and the reduction in adiposity.

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