



+ Site Statistics

References: 53,517,315
 Abstracts: 29,339,501

+ Search Articles

+ Subscribe to Site Feeds



+ PDF Full Text



+ Follow Us



Brown adipose tissue activation as measured by infrared thermography by mild anticipatory psychological stress in lean healthy females

+ Translate

Brown adipose tissue activation as measured by infrared thermography by mild anticipatory psychological stress in lean healthy females

ROBINSON, L.J.; LAW, J.M.; SYMONDS, M.E.; BUDGE, H.

Experimental Physiology 101(4): 549-557

2016

What is the central question of this study? Does psychological stress, which is known to promote cortisol secretion, simultaneously activate brown adipose tissue function in healthy adult females? What is the main finding and its importance? One explanation for the pronounced differences in brown adipose tissue function between individuals lies in their responsiveness to psychological stress and, as such, should be taken into account when examining its in vivo stimulation. Brown adipose tissue (BAT) has been implicated in the pathogenesis of obesity, type 2 diabetes and the metabolic syndrome and is a potential therapeutic target. Brown adipose tissue can have a significant impact on energy balance and glucose homeostasis through the action of uncoupling protein 1, dissipating chemical energy as heat following neuroendocrine stimulation. We hypothesized that psychological stress, which is known to promote cortisol secretion, would simultaneously activate BAT at thermoneutrality. Brown adipose tissue activity was measured using infrared thermography to determine changes in the temperature of the skin overlying supraclavicular BAT (TSCR). A mild psychological stress was induced in five healthy, lean, female, Caucasian volunteers using a short mental arithmetic (MA) test. The TSCR was compared with a repeated assessment, in which the MA test was replaced with a period of relaxation. Although MA did not elicit an acute stress response, anticipation of MA testing led to an increase in salivary cortisol, indicative of an anticipatory stress response, that was associated with a trend towards higher absolute and relative TSCR. A positive correlation between TSCR and cortisol was found during the anticipatory phase, a relationship that was enhanced by increased cortisol linked to MA. Our findings suggest that subtle changes in the level of psychological stress can stimulate BAT, findings that may account for the high variability and inconsistency in reported BAT prevalence and activity measured by other modalities. Consistent assessment of this uniquely metabolic tissue is fundamental to the discovery of potential therapeutic strategies against metabolic disease.

(PDF same-day service: \$19.90)

Accession: 057328911

Download citation: [RIS](#) [BibTeX](#) [Text](#)

PMID: 26855404

DOI: 10.1113/EP085642

Related references

Infrared thermography for indirect assessment of activation of brown adipose tissue in lean and obese male subjects. Physiological Measurement 37(12): N118-N128, 2016

Online

Questions about
our PDF Supply
Service?

A new method of infrared thermography for quantification of brown adipose tissue activation in healthy adults (TACTICAL): a randomized trial. Journal of Physiological Sciences, 2016

Multimodal Imaging for the Detection of Brown Adipose Tissue Activation in Women: A Pilot Study Using NIRS and Infrared Thermography. Journal of Healthcare Engineering 2017: 5986452-5986452, 2017

Is It Possible to Detect Activated Brown Adipose Tissue in Humans Using Single-Time-Point Infrared Thermography under Thermoneutral Conditions? Impact of BMI and Subcutaneous Adipose Tissue Thickness. Plos One 11(3): E0151152-E0151152, 2016

Hot fat in a cool man: infrared thermography and brown adipose tissue. Diabetes, Obesity & Metabolism 13(1): 92-93, 2011

Infrared thermography in the detection of brown adipose tissue in humans. Physiological Reports 2(11): -, 2014

Can non-shivering thermogenesis in brown adipose tissue following NA injection be quantified by changes in overlying surface temperatures using infrared thermography?. Journal of Thermal Biology 36(2): 85-93, 2011

Comparison of T1 relaxation times in adipose tissue of severely obese patients and healthy lean subjects measured by 1.5 T MRI. Nmr in Biomedicine 27(9): 1123-1128, 2015

Brown adipose tissue density measured by near-infrared time-resolved spectroscopy in Japanese, across a wide age range. Journal of Biomedical Optics 23(6): 1-9, 2018

Brown adipose tissue volume in healthy lean south Asian adults compared with white Caucasians: a prospective, case-controlled observational study. Lancet. Diabetes & Endocrinology 2(3): 210-217, 2015

Brown adipose tissue 5-T4-deiodinase activity is lower in 12 day obese vs lean Zucker-Brown Norway pups. FASEB Journal 9(3): A187, 1995

Psychological stress activates a dorsomedial hypothalamus-medullary raphe circuit driving brown adipose tissue thermogenesis and hyperthermia. Cell Metabolism 20(2): 346-358, 2015

Stress-induced activation of brown adipose tissue prevents obesity in conditions of low adaptive thermogenesis. Molecular Metabolism 5(1): 19-33, 2016

Inverse association between brown adipose tissue activation and white adipose tissue accumulation in successfully treated pediatric malignancy. American Journal of Clinical Nutrition 95(5): 1144-1149, 2012

The adipose tissue young cats after cold stress apparent morphological transformation from white to brown adipose tissue. Acta Anatomica 130(1): 54, 1987

[< Previous](#)

[^ Chapter](#)

[Next >](#)

Copyright © 2019 EurekaMag.com · All Rights Reserved · 浙ICP备10204677号-1
Privacy · Disclaimer · Terms · Contact · DMCA/Copyright Takedown Request