
МАТЕРИАЛЫ КОНФЕРЕНЦИИ
И ШКОЛЫ

**BEIGE ADIPOCYTE AS A TOOL FOR FINE ADJUSTMENT
OF THERMAL HOMEOSTASIS**

© 2020 г. Е. I. Elsukova

Krasnoyarsk State Pedagogical University, Krasnoyarsk, Russia

e-mail: elsukova@kspu.ru

DOI: 10.31857/S0044452920071705

Brown adipose tissue is considered to play an important role in the development of mammal endothermy. Thermogenesis based on the uncoupling of oxidative phosphorylation and respiration by the UCP1 protein is necessary for maintaining of temperature homeostasis during short-term temperature fluctuations, with seasonal adaptations, and during exit from torpor. Recently, another type of UCP1-expressing adipose cells was discovered. These cells named beige adipocytes arise from the precursors distinguished from the brown adipocytes precursors. Beige adipocytes are diffusely distributed in fat depots and visceral tissues. The purpose of the report is to discuss the possible function of these cells.

It was found that the dynamics of the beige adipocyte population is not always associated with temperature adaptations. Calculations based on O₂ consumption rate data for the cultures of these cells [Chechi et al, 2012]

indicate that the single beige adipocyte, even at a thermogenic capacity equal to that of brown adipocyte, can only provide heating of its immediate microsurrounding. Thus, UCP1-dependent thermogenesis probably developed in different mammalian fat cell lines independently and for different tasks. Taking into account the information on the high thermosensitivity of some processes essential for cell/tissue homeostasis, as well as data on the correlated changes in UCP1 expression and cell renewal including some types of muscle regeneration and tumors we suggest a role of beige adipocytes in the local weak heating of special cell niches. While massive depots of brown fat are involved in maintaining of temperature homeostasis of the whole organism, beige adipocytes ensure a fine local adjustment of thermal optima required for plastic processes in tissues.

Supported by state budget.