

## **Abstract**

Historical experiments regarding the influence of low ambient temperatures were often accompanied with the development of detrimental effects. Our laboratory recently published a protocol of mild cold acclimation (5 weeks in  $8 \pm 1$  °C) which induces cardioprotective phenotype in rats (*Rattus norvegicus*). An important mechanism of cold acclimation is the activation and increase of brown adipose tissue. Besides the nonshivering thermogenesis brown adipose tissue can produce a multitude of autocrine, paracrine, and endocrine factors which might positively influence whole-body metabolism and function of other important organs. The effect of cold acclimation on brown adipose tissue is not however explored very well. The aim of this work was to assess selected parameters of respiration of isolated brown adipose tissue mitochondria of control rats living in  $24 \pm 1$  °C and compare it with that of rats exposed to  $8 \pm 1$  °C for 1 day, 3 days, 10 days, and 5 weeks. Results of this work were 1) the increase in respiration occurs after the 1-day cold exposure and 2) the highest respiration per 1 mg of mitochondrial protein appears to be after the 10 days of cold exposure.

**Key-words:** Brown adipose tissue, mitochondria, respiration, cold acclimation