

KRISTIANA SKLIOUTOVSKAYA-LOPEZ, Dept of Natural Sciences, University of Charleston, Charleston, WV, 25304, JACALINE PARKMAN, Dept of Biomedical Sciences, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV 25755, and JUNG HAN KIM, Dept of Biomedical Sciences, Joan C. Edwards School of Medicine, Marshall University, Huntington, WV 25755. *Ucp1* and metabolism-related gene expression response to high fat diets in brown adipose tissue of TALLYHO/JngJ vs. C57BL/6J mice.

In the midst of the ongoing obesity epidemic, brown adipose tissue (BAT) has emerged as a potential therapeutic target. BAT is a thermogenic organ in mammals that is characterized by adipocytes with numerous mitochondria. BAT uses cellular free fatty acids derived from the lipolysis of triglyceride droplets to generate heat via the action of uncoupling protein 1 (*Ucp1*), located in the inner mitochondrial membrane. In this study, we analyzed mRNA and protein levels of *Ucp1* and genes related to inflammation, mitochondrial biogenesis, and lipolysis in BAT of the TALLYHO/JngJ (TH) mouse, a polygenic model of obesity and type 2 diabetes. At four weeks of age, TH and C57BL/6J (B6) mice were weaned onto chow or high fat (HF) diets. At twenty weeks of age, mice were killed, and interscapular BAT was collected. BAT of TH mice appeared discolored and larger than that of B6. mRNA and protein levels in BAT were measured using qPCR and western blot analysis, respectively. There were no significant differences in *Ucp1* mRNA levels between TH and B6 mice on either diet. Inflammatory marker interleukin 6 (*IL6*) mRNA levels were significantly increased in TH mice on HF diets compared to other groups. Interestingly, HF diets increased adipose triglyceride lipase (*ATGL*) mRNA levels in B6 mice, but not in TH. In summary, we observed genotype-dependent responses to HF diets for *IL6* and *ATGL* expressions in BAT of TH and B6 mice. These results may signify increased inflammation and reduced lipolysis in BAT during the development of obesity.