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Sex-specific effects of the high fat and sugar diet on FGF21 signaling in brown adipose tissue in C57BL mice

Tatiana Iakovleva, Balybina N Ju, Makarova E N and Bazhan N M
Institute of Cytology and Genetics, Russia

The energy-burning capacity of Brown Adipose Tissue (BAT) makes it an attractive target for use in anti-obesity therapies. There are sex differences in the metabolic disorders development: High fat diet induces hyperglycemia development in males, but not in females. Serum FGF21 levels are associated with BAT activity. We investigated the effects of high fat and sugar diet (10 weeks) on blood levels of FGF21, insulin, leptine, glucose, on mRNA levels of genes involved in FGF21 signaling (FGF21, Klotho beta, PPAR γ) and on mRNA levels of genes related to BAT activity (UCP1, SLC2A1, CPT1, DIO2 and HSL) in females and males of C57BL mice. We found that diet induced obesity, increased blood levels of FGF21, glucose and leptin in females and males and induced hyper-insulinemia development in males. We found also that diet impaired BAT FGF21 signaling only in males: Increased mRNA level of FGF21 and reduced mRNA levels of Klotho beta and PPAR γ . Obviously due to impaired FGF21 signaling high blood FGF21 levels and increased BAT FGF21 expression were associated with decreased expression of SLC2A1 and unaltered expression of UCP1 genes in BAT of obese males. In females, the diet did not affect FGF21 signaling. This study was supported by the Russian Science Foundation, Grant No 17-15-01036.

Biography

Tatiana Iakovleva has graduated from Novosibirsk University in 1988. She is a leading researcher at the Institute of Cytology and Genetics, Russia

tatyanajakovleva@yandex.ru

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