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Sex-dependent differences of mineralocorticoid system activity in melanocortin obesity in Ay mice

A gouti yellow mice (Ay) with melanocortin obesity is a convenient model for studying of the molecular mechanisms of non-dietary type of obesity. It has been shown recently that mineralocorticoid system played an important and sex dependent role in obesity development. Complications associated with it often led to the chronic heart and renal failure. However, sex dependent characteristics of the mineralocorticoid system activity at this type of obesity have not been adequately studied. The aim of this work was to investigate the expression of mineralocorticoid receptor (MR) and aldosterone level in female and male Ay mice. Using the real-time PCR method, the mRNA level of the MR in the hypothalamus, heart left ventricle and adipocytes in adult female and male Ay mice at the age of 30-32 weeks was investigated. The level of aldosterone in the blood was studied using the enzyme immunoassay method (Mouse Aldosterone (ALD) ELISA kit). Twice, as high level of MR mRNA has been detected in female adipocytes and in heart left ventricle in female Ay mice compared to male ($p \leq 0.05$). No significant differences in MR mRNA level in the pituitary glands have been identified. Sex dependent difference in the blood aldosterone levels (224.6±25.1 and 102.8±16.5 pg/ml in the female and male Ay, $p \geq 0.05$) has been shown. These data indicate that melanocortin obesity in female Ay is associated with aldosterone and mineralocorticoid system activation.

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Biography

N S Logvinenko is a Senior Scientist at the Institute of Cytology and Genetics, Russian Academy of Sciences, Novosibirsk. Her main fields of scientific interests are: (1) Molecular mechanisms of aldosterone regulation of kidney function during postnatal ontogenesis; (2) The effects of kinase phosphorylation of the alpha-subunit of kidney Na+-K+-ATPase on the biological activity of the enzyme; (3) Nongenomic aldosterone effects on the kidney ENaC activity and (4) Investigation of the mineralocorticoid receptors and aldosterone nongenomic effects in Ay mice with melanocortin obesity.

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