

## **AGE-RELATED SHIFTS IN THE ACTIVITY OF CENTRAL NEUROPEPTIDE SYSTEMS INVOLVED IN ENERGY BALANCE**

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Long-term regulation of energy balance is characterized by two major trends: weight gain of the middle-aged and anorexia in old populations. This anorexia aggravates the age-associated loss of active tissues resulting in sarcopenia. Aging-associated shifts in the activity of central catabolic and anabolic neurohumoral systems may be assumed in the background. We studied the effects of catabolic alpha-melanocyte-stimulating hormone (alpha-MSH), corticotropin releasing factor (CRF), and of anabolic neuropeptide Y (NPY) on food intake (FI) in different age-groups of rats. Male Wistar rats aged 2-, 3-4-, 6-, 12-, 18- or 24-months represented juvenile, young adult, two middle-aged and two old groups. FI-values were measured following intracerebroventricular injections of alpha-MSH (5 µg), CRF (0.3 µg), NPY (5 µg) or saline. Alpha-MSH and CRF suppressed, NPY increased FI. Alpha-MSH attenuated both spontaneous FI and re-feeding (REF) following 24-h fasting. At the second hour of REF 22% reduction was shown in juvenile, 69 % in young adult, a decreasing suppression in middle-aged (56% vs. 26%), and an extreme one (94% vs. 74%) in old animals. Catabolic effects of CRF were also weaker in middle-aged than in young rats. Anabolic NPY on the other hand showed strong effects in young, decreased efficacy in old and an enhanced one in middle-aged rats. Our results suggest characteristic age-related non-linear shifts in the effects of central neuropeptides, which may contribute to the explanation of both the development of middle-aged obesity and weight loss in the old. (OTKA 049321, PTE AOK-KA-34039-25/2009)