MMSL
Military Medical
Science Letters
Since 1925

Mil. Med. Sci. Lett. (Voj. Zdrav. Listy) 2018, 87(supplementum 1)
ISSN 2571-113X (Online)

MEETING ABSTRACTS

BUTYRYLCHOLINESTERASE AS A GHRELIN MODULATOR IMPACTING ANXIETY, STRESS, OBESITY, AND DRUG CRAVINGS

S. Brimijoin, Y. Gao, L.Y. Geng, V.P. Chen

Molecular Pharmacology and Experimental Therapeutics, Mayo Clinic. Rochester MN, USA 55905

Our recent studies on butyrylcholinesterase (BChE) have led us to conclude that this enzyme has a major physiological role in regulating levels and impact of ghrelin, the "hunger hormone." A key step toward this realization was finding that, over time, group-housed mice given AAV8-BChE expression vector showed a sharp drop in fighting. Eventually we linked this reaction to a large decrease in plasma ghrelin, which is involved in food-seeking and stress. At first, we assumed that lowered ghrelin was reducing stimulation of growth hormone secretagogue receptors in brain. Instead, treated mice showed *larger* pulses of circulating growth hormone after i.v. ghrelin injection. In other words, high plasma BChE enhanced sensitivity of ghrelin's target, the growth hormone secretagogue receptor, involved in emotional behaviors. That also fits BChE's impact on feeding. BChE knockout mice have high ghrelin levels that drive overeating and obesity. BChE-enhanced mice have low plasma ghrelin, they resist obesity on high-fat diet and show less rebound weight gain after a forced low-calorie diet. These findings suggest that BChE gene transfer could have substantial therapeutic impact on obesity and other conditions that involve ghrelin.