

P3.02.

Galanin is expressed in kisspeptin neurons and co-localizes with kisspeptin within afferents to GnRH neurons in the mouse brain

Vida, B.¹; Molnár, C. S.¹; Hrabovszky, E.¹; Bardóczi, Z.¹; Caraty, A.³; Coen, C. W.⁴; Liposits, Z.^{1,2}; Kalló, I.^{1,2*}

1: Laboratory of Endocrine Neurobiology, Institute of Experimental Medicine, Budapest, Hungary

2: Department of Neuroscience, Faculty of Information Technology, Pázmány Péter Catholic University, Budapest, Hungary

3: INRA//CNRS/Univ Tours/Haras Nationaux, Nouzilly, France

4: School of Medicine, King's College London, London, UK

Kisspeptin (KP) and galanin are important regulators of the GnRH secretion. The current study investigated whether galanin is expressed in KP cells and the galanin peptide is present in KP afferents onto GnRH neurons. Animal models with the highest KP incidence were selected for studying galanin expression in the rostral periventricular area of the third ventricle (RP3V) and the arcuate nucleus (Arc); these were ovariectomised 17 β -estradiol-treated (OVX+E2) and OVX oil-treated (OVX+oil) mice, respectively. In situ hybridization revealed the galanin transcript in 39% of KP neurons of the RP3V; the ratio in the Arc was 43%. Double-labeling immunohistochemistry showed galanin immunoreactivity (IR) in 88% of KP neurons in the RP3V and 14% of KP cells in the Arc of colchicine-treated animals. The percentage of double-labeled neurons was significantly lower (5%; $p < 0.02$) in the Arc, but not the RP3V (92%) of male rats. The confocal microscopic analysis was extended to the level of KP axon terminals and showed galanin-IR in ~ 30% of KP appositions onto GnRH neurons in OVX+E2 mice. The co-localization level fell to ~ 5% ($p < 0.05$) in OVX+oil animals. The presence and estrogen-dependent regulation of galanin within KP axon terminals on GnRH neurons add a new aspect to the role played by galanin in the central regulation of reproduction.

This work was supported by OTKA K69127, T73002, K83710; ETT 122/2009 and FP7/2007-2013, grant agreement n° 245009.