

P3.01.

Tuberoinfundibular peptide of 39 residues is activated during lactation and participates in the suckling-induced prolactin release in rat

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Tuberoinfundibular peptide of 39 residues (TIP39) and the parathyroid hormone 2 receptor (PTH2R) constitute a unique peptide-receptor neuromodulator system, which may be involved in neuroendocrine regulations based on its distribution in the hypothalamus. TIP39 expression decreases dramatically by adulthood. In the present study, we demonstrated that TIP39 mRNA and peptide expressions are markedly elevated in neurons of the posterior intralaminar complex of the thalamus (PIL) in lactating dams, one of the 3 locations of TIP39 perikarya in the brain. In addition, these TIP39 neurons showed pup-induced Fos expression. TIP39 fibers are present in the hypothalamic para-, periventricular and arcuate nuclei. We demonstrated neuronal projections from the posterior intralaminar TIP39 perikarya to the arcuate nucleus injecting either retrograde or anterograde tracers to the PIL or the arcuate nucleus, respectively. Subsequently, we addressed the function of TIP39 in the PIL: mothers separated from their pups for 4 hours received injection of a PTH2 receptor antagonist into the lateral ventricle, 5 min before returning the pups. Blood samples were taken 7 times during the experimental period through jugular cannulae. The PTH2 receptor antagonist markedly inhibited suckling-induced elevation of plasma prolactin levels in a dose-dependent manner. These results suggest that TIP39 neurons in the PIL may regulate suckling-induced prolactin release in rat dams.

Grant support: OTKA NK72929.