

Title: Galanin/ Neuropeptide Y Y1 receptor interaction at the cellular and receptor level in the amygdala

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Abstract: Galanin (GAL) interacts functionally with Neuropeptide Y Y1 receptor (Y1) in the nucleus tractus solitarius and the arcuate nucleus. Since GAL and Y1 participate in mood disorders, the aim of this work was to analyze GAL/Y1 interactions in the amygdala (AMY), a key nucleus for fear, mood, and motivation. We have combined an autoradiography study with the analysis of the expression of c-Fos immunoreactivity (c-Fos IR) in the AMY. Rats (n=6) were sacrificed 15 minutes after intracerebroventricular injections (icv) of GAL (3nmol) and AMY sections were incubated with Y1 agonist [125I]-Leu31-Pro34-PPY (25 pM). The autoradiograms were analyzed using the NIH image analysis system. In c-Fos IR experiments, groups of anaesthetized rats (n=4) received icv GAL (3nmol) and the Y1 agonist Leu³¹-Pro³⁴NPY (3nmol) alone or in combination, and the rats were sacrificed 90 minutes after the injections. AMY sections were stained with immunohistochemical of c-Fos protein (1:5000). Stereological analysis was performed in: Basal (BA), lateral (LA), Central [lateral capsular subdivision (CeC), lateral intermediate subdivision (CeI), medial subdivision (CeM)] and the medial paracapsular intercalated (ITC) subnuclei of the AMY. Student's unpaired t-test and ANOVA followed by Newman-Keuls were used in autoradiographic and c-Fos IR studies. We observed that GAL significant increased (p<0,05) the Y1 receptor agonist binding, [125I]Leu31Pro34-PYY in the AMY. Within the AMY, GAL increased c-Fos IR in ITC and CeC; the Y1 agonist induced an increased of c-Fos IR in BA and CeC, while a decrease in c-Fos IR was observed in LA and ITC. However, we only observed a modification of the c-Fos expression after the coadministration of both peptides compared to the effect of GAL or the Y1 agonist alone in the ITC. The coadministration of both peptides significantly decreased the c-Fos expression (P<0,05) induced by GAL or the Y1 agonist alone. These results demonstrate an interaction between GAL and NPY Y1 at the cellular and receptor level in the AMY and suggest that endogenous GAL and NPY system might interact to regulate emotional behaviours.

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