

β 2-Adrenoceptor stimulation restores frontal cortex plasticity and improves visuospatial performance in hidden-prenatally-malnourished young-adult rats

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© 2014 Elsevier Inc. Moderate reduction in dietary protein composition of pregnant rats from 25% to 8% casein, calorically compensated by carbohydrates, has been described as a "hidden malnutrition" because it does not alter body and brain weights of pups at birth. However, this dietary treatment leads to altered central noradrenergic systems, impaired cortical long-term potentiation (LTP) and worsened visuo-spatial memory performance. Given the increasing interest on the role played by β 2-adrenoceptors (β 2-ARs) on brain plasticity, the present study aimed to address the following in hidden-malnourished and eutrophic control rats: (i) the expression levels of β 2-ARs in the frontal cortex determined by immunohistochemistry, and (ii) the effect of the β 2 selective agonist clenbuterol on both LTP elicited in vivo in the prefrontal cortex and visuospatial performance measured in an eight-arm radial maze. Our results showed that, prenatally malnourished rats exhibited a significant reduction