Hidden prenatal malnutrition in the rat: Role of ?1- adrenoceptors on synaptic plasticity in the frontal cortex

Flores, Osvaldo

Pérez, Hernán

Valladares, Luis

Morgan, Carlos

Gatica, Arnaldo

Burgos, Héctor

Olivares, Ricardo

Hernández, Alejandro

Moderate reduction in the protein content of the mother's diet (hidden malnutrition) does not alter body and brain weights of rat pups at birth, but leads to dysfunction of neocortical noradrenaline systems together with impaired long-term potentiation and visuo-spatial memory performance. As ?1-adrenoceptors and downstream protein kinase signaling are critically involved in synaptic long-term potentiation and memory formation, we evaluated the ?1-adrenoceptor density and the expression of cyclic-AMP dependent protein kinase, calcium/calmodulin-dependent protein kinase and protein kinase Fyn, in the frontal cortex of prenatally malnourished adult rats. In addition, we also studied if ?1-adrenoceptor activation with the selective ?1 agonist dobutamine could improve deficits of prefrontal cortex long-term potentiation presenting these animals. Prenatally malnourished rats exhibited half of ?1-adrenoceptor binding, together with a 51% and 65% reduction of cyclic AMP-dependent protein kina