

Effects of prenatal stress and maternal care on genetic patterning of the hippocampus in neonate rats

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Prenatal stress (PS) and variations in maternal care (licking/grooming (LG)) produce enduring changes in the hypothalamo-pituitary-adrenal axis (HPA) accompanied by cognitive and behavioral alterations. However, the mechanisms involved in the programming of HPA functions and behavior remain obscure. During development, connectivity and patterning of the brain into distinct functional areas involve the expression of a set of specific genes. We hypothesized that PS and maternal care may alter the expression of genes such as the limbic system associated membrane protein (LAMP) involved in patterning and connectivity of the neural stress circuitry, especially in the hippocampus. LAMP *in situ* hybridization was performed on brains from male neonates (postnatal days 1 and 7) of mother rats (High LG and Low LG) that were either exposed to daily restraint or remained in their home cage during the last week of gestation. The results show a significant decrease in dorsal hippocampal LAMP expression in the day 1 old offspring of Low but not High LG mothers that were exposed to restrain stress during pregnancy. Interestingly, LAMP expression was decreased in the day 7 old offspring of High but not Low LG mothers that were exposed to restrain stress during pregnancy. These findings suggest an interaction between PS and maternal phenotype (Low LG vs High LG) that can alter genes involved in hippocampal patterning and ultimately produce long-lasting structural changes that can serve as a basis for individual differences in stress sensitivity of the offspring. (Supported by FRSQ and CIHR).

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