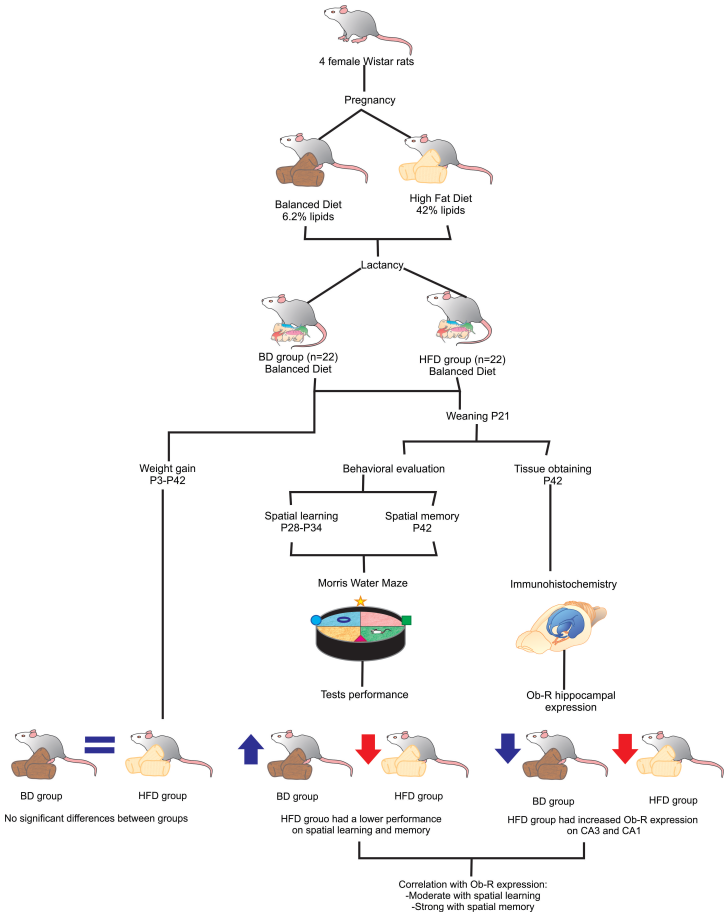
Maternal high-fat diet during gestation increases leptin receptor expression in hippocampus and causes impairs spatial learning and memory in rat offspring.

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Abstract

Statement of the Problem: There are many dietary recommendations about pregnant women, however, food with high lipid levels are often preferred and their consumption during pregnancy could influence on neurodevelopment and cognitive abilities of the neonate later in life. **Aim:** To analyze the effects of a high-fat diet during gestation on spatial learning and memory, and on the expression of leptin receptors (Ob-R) on hippocampal CA1 and CA3 areas. **Methodology:** Wistar rats were used: 22 which mother was fed balanced diet (BD) and 22 from a mother fed a high fat diet (HFD). Weight gain was measured daily. Later, spatial learning and memory were evaluated using the Morris Water Maze (MWM). Hippocampal Ob-R expression in hippocampal areas was analyzed by optical density. **Findings:** About weight gain were no significant differences, but HFD pups showed a tendency to a higher increase in body weight on last weeks. HFD required significantly more time to find the platform compared with BD during the learning phase. About swimming velocity (s) and distance traveled (cm), was no significant difference between groups. On memory phase, offspring born to HFD dams spent significantly less time in the platform's quadrant (C3) compared with BD pups. Analysis of immunohistochemical staining showed Ob-R expression in astrocytes was significantly higher in HFD offspring; both Schaffer collateral-CA1 and mossy fibers-CA3, in contrast, expression was lower in BD offspring. Correlation analysis showed a strong positive correlated: rats used longer time to find the platform, had higher expression of leptin receptors in hippocampal astrocytes in Schaffer collateral- CA1 and mossy fibers-CA3. About memory spatial, results showed a positive correlation; such that rats spent less time in the C3 had more leptin receptor expression in hippocampal astrocytes in these areas. **Conclusion:** Maternal exposure to HFDs could affect the neurodevelopment and cognitive function of the offspring.

Image



Recent Publications

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Biography

Nadia Cortés-Alvarez is master in medical science and is currently studying the doctorate. She has investigated the effects of high fat-diet intake on different cognitive processes in addition to the influence of biomarkers. She is co-authored the chapter "How maternal high-fat diets during gestation affect the neurodevelopment of Offspring" in the book entitled Horizons in Neuroscience Research.

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