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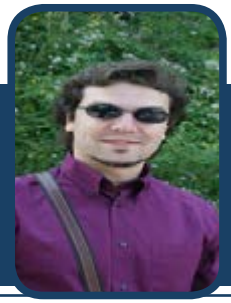

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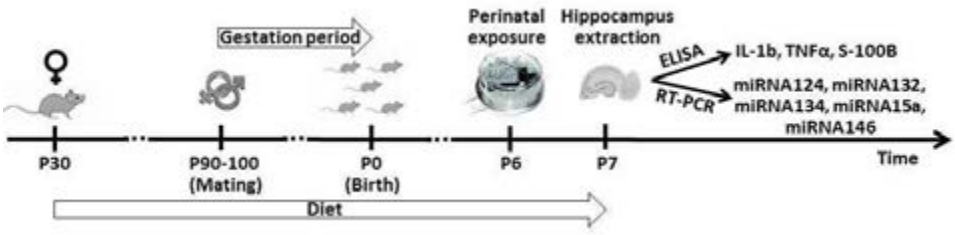
The epigenetic transgenerational effect of maternal diet on offspring brain development in an animal model of perinatal asphyxia

Statement of the Problem: Hypoxic-ischemic encephalopathy (HIE) secondary to perinatal asphyxia (PA) affects especially vulnerable brain areas such as hippocampus and is a leading cause of neonatal morbidity. During pregnancy, high-fat diet (HFD) can induce developmental changes that might enhance the risk of peripartum complications including HIE secondary to PA. Trans-resveratrol (tRESV), is a polyphenol with antioxidant properties that can be used as a maternal dietary supplement in PA. The aim of this study was to identify new epigenetic mechanisms of brain inflammation and injury related to PA, to explore the benefit of tRESV enriched maternal diet and the potential negative impact of the HFD.

Methodology & Theoretical Orientation: The hippocampal interleukin 1 beta (IL-1b), tumor necrosis factor alpha (TNFα) and S-100B protein, were assessed in postnatal day 6 rats exposed to asphyxia, the offspring of female Wistar rats expose to an enriched diet of high-fat or tRESV. The expression of non-coding microRNAs miR124, miR132, miR134, miR146 and miR15a as epigenetic markers of hippocampus response to PA was determined 24 hours post-asphyxia.

Findings: Neural response to PA could be epigenetically controlled. Maternal HFD additionally increases hippocampal TNFα, IL-1b, and S-100B after PA. PA associated with maternal HFD induces miR124 up regulation and miR132 down regulation relative to PA only. tRESV reduces asphyxia-related neuroinflammation and neural injury and down-regulates miR132 and miR15a.

Conclusion & Significance: This data supports the neuroprotective quality of tRESV when used as a supplement in the maternal diet on the offspring's outcome in PA.HFD increases the PA-induced neuroinflammation and neuronal injury, and epigenetically influences homeostatic synaptic plasticity and neuronal tolerance to asphyxia.



Biography

Arsene Cosmin has his expertise in research and molecular diagnostics. He is also a member of Epigenetics and Metabolomics Association, researcher at The Research Institute of the University of Bucharest (ICUB), scientific consultant at Genetic Center Romania, and one of the few fellows in Romania advocating the importance of epigenetics in his country. Recently he was selected as an Expert-Evaluator (Genetics, Epigenetics) in H2020 at the European Commission, Research Executive Agency (REA).

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