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Astroglial cell cultures do not produce resolvin D1 in course of LPS-induced responseDmitryi V Chistyakov¹, Alina A Astakhova¹, Marina G Sergeeva¹ and Nadezda V Azbukina²¹A N Belozersky Research Institute of Physico-Chemical Biology - MSU, Russia²Moscow State University, Russia

Statement of the Problem: Neuroinflammation is an innate immune response that accompanies numerous disorders within CNS, including neurodegenerative conditions like Alzheimer's disease, Parkinson's disease, stroke, cancer and others. In spite of its primary protective role, neuroinflammation often takes form of a chronic process and represents a damaging factor, exacerbating nervous tissue injury. Mechanisms that could switch immune response within CNS to physiological termination, referred to as resolution, are of high scientific and practical interest. In the current study, we have analyzed release of Resolvin D1 (RvD1) – a major lipid mediator of inflammation resolution derived upon enzymatic processing of docosahexaenoic acid (DHA) in mixed cultures of primary astrocytes within an in vitro model of neuroinflammation.

Methodology & Theoretical Orientation: Primary cultures of glial cells enriched in astrocytes were obtained from brains of neonatal Wistar rat pups by conventional procedures. Cells were stimulated with LPS for 4 and 24 hours. Cell lysates and cell free culture media were used to analyze COX-2 and TNF α expression as well as PGE2 release. RvD1 and DHA concentrations in cell-free culture media were analyzed by ELISA and HPLC/MS.

Conclusion & Significance: Glial cultures responded to LPS stimulation with upregulation of COX-2 and TNF α on both mRNA and protein levels and increase in DHA and PGE2 production. At the same time RvD1 was not detected in cell lysates or cell free culture media. The obtained results indicate that astrocytes are not directly involved into resolvin production upon LPS stimulation and have a unique role in the process of inflammatory response resolution within CNS.

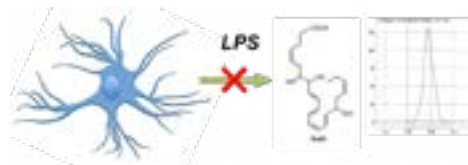


Fig. 1. Astroglial cultures stimulated with LPS do not produce ResD1, important mediator of inflammatory response resolution.

Biography

Dmitryi V Chistyakov has his expertise in cell signaling pathways controlling inflammatory responses within the central nervous system. His scientific interests concern mechanisms that control innate immune response within nervous tissue on cellular level. Investigations within this field have brought him to the question about mRNA stability control during inflammatory response on the level of cells. These two processes – activation of innate immune response and post-transcriptional gene expression regulation turned out to be crucial for glioma development as well. Understanding their interaction during tumor development is one of the attractive directions of his research development.

chistyakov@gmail.com

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