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ISEV2020 Abstract Book

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About ISEV

The International Society for Extracellular Vesicles is the leading professional society for researchers and scientists involved in the study of microvesicles and exosomes. With nearly 1,000 members, ISEV continues to be the leader in advancing the study of extracellular vesicles. Founded in 2012 in Sweden, ISEV has since moved its Headquarters to the United States. Through its programs and services, ISEV provides essential training and research opportunities for those involved in exosome and microvesicle research.

Mission Statement

Advancing extracellular vesicle research globally.

Vision

Our vision is to be the leading advocate and guide of extracellular vesicle research and to advance the understanding of extracellular vesicle biology.

ISEV2020 Annual Meeting

The International Society for Extracellular Vesicles is the is the premier international conference of extracellular vesicle research, covering the latest in exosomes, microvesicles and more. With an anticipated 1,000 attendees, ISEV2020 will feature presentations from the top researchers in the field, as well as providing opportunities for talks from students and early career researchers.

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Journal of Extracellular Vesicles: Editors in Chief

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markers for T cells. A set of microRNAs (miRNAs) in circulating EVs were diminished in Rag KO mice. In vivo transfer of circulating EVs rescues the social behavioural deficits of Rag KO mice and ameliorate the c-Fos immunoreactivities in mPFC of Rag KO mice.

Summary/Conclusion: Our data showed that circulating EV profiles were altered in mice lacking adaptive immune cells and, accordingly, showing social behavioural deficits. Notably, our in vivo experiments suggest that circulating EVs may contribute to social behaviours. Further study will provide a novel biological insight into the mechanisms underlying peripheral-to-brain immune communication via EVs.

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MicroRNA profile of circulating extracellular vesicles are associated with upregulation of neuroinflammatiory signalling pathway in aged animals

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Introduction: The involvement of neuroinflammation on ageing process is widely recognized. Extracellular vesicles (EVs), such as exosomes, are able to cross the blood-brain barrier and were related to neuroinflammation. In this context, EVs have been considered a potential mechanism of spreading molecules, including microRNAs (miRNAs) that can promote mRNA degradation or inhibit translation of their targets. Our aim was to investigate the miRNA profile of circulating total EVs during ageing process and their impact on canonical pathways.

Methods: The Local Ethics Committee (Comissão de Ética no Uso de Animais – UFRGS; n 29818) approved all animal procedures and experimental conditions. Plasma was obtained from Wistar rats (3 and 21 months-old) and total EVs were isolated. EV microRNA isolation and microarray expression analysis was performed to determine the predicted regulation of targeted mRNAs.

Results: The analysis of global microRNA expression revealed 48 differentially expressed microRNAs ($p < 0.05$; fold change of $\geq |1.1|$); 18 miRNAs were up-regulated and 30 were down-regulated in circulating total EVs from aged animals compared to young-adult ones. A conservative filter was applied on Ingenuity Pathway Analysis (IPA) and only experimentally validated and highly conserved predicted mRNA targets were used. IPA showed that neuroinflammation signalling is ranked among the top canonical pathway impacted by differentially expressed microRNAs and is upregulated in aged animals ($p < 0.0001$; z-score: 3.413). The differentially expressed miRNAs impacted 32 molecules in the neuroinflammation pathway. Interestingly, the ion channel GRIN2B is predicted to be up regulated and is a target of many EVs miRNAs; in accordance with our results GRIN2B was previously related to neurodegenerative diseases. Moreover, let-7a-5p is predicted to be downregulated and target all the 32 molecules of the neuroinflammation signalling pathway. Previous studies have correlated let-7a-5p and neurodegenerative diseases.

Summary/Conclusion: Our data suggest that circulating total EVs cargo, specifically miRNAs, are altered by ageing and impact neuroinflammation pathway, suggesting the involvement EVs miRNA on ageing-induced susceptibility of neurodegenerative diseases.

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