Journal of Extracellular Vesicles

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/zjev20

ISEV2020 Abstract Book

To cite this article: (2020) ISEV2020 Abstract Book, Journal of Extracellular Vesicles, 9:sup1, 1784511, DOI: 10.1080/20013078.2020.1784511

To link to this article: https://doi.org/10.1080/20013078.2020.1784511

Published online: 15 Jul 2020.

JOURNAL OF EXTRACELLULAR VESICLES
2020, VOL. 9, 1784511
https://doi.org/10.1080/20013078.2020.1784511

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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

Jan Lotvall (Sweden)

were isolated by ultracentrifugation (164,071 x g) following precipitation with polyethylene-glycol. The concentration and size distribution of sEVs and large EVs were measured by a tunable resistive pulse sensing analysis.

Results: There was no significant difference in the total concentration of plasma sEVs between WKY and SHR or between young and aged rats. The mean diameter of plasma sEVs from aged rats was larger than that from young rats in both WKY and SHR. Also, the number of particles with a diameter of smaller than 150 nm in plasma sEVs from aged rats was lower than that from young rats. The concentration of plasma large EVs from aged rats was higher than that from young rats in both WKY and SHR. There was no significant difference in the size distribution of plasma large EVs between WKY and SHR or between young and aged rats.

Summary/Conclusion: The present results for the first time demonstrate that the concentration of plasma large-sized EVs is increased by ageing, while there is no difference in the concertation and size distribution of EVs between WKY and SHR. Further research is required to clarify the cause of age-dependent alternation in plasma EV size distribution and its physiological meaning.

PS06.03

microRNA profiling of circulating extracellular vesicles is involved with susceptibility to age-related diseases: relevance to cardiovascular signalling in ageing process

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Introduction: Ageing represents a central risk factor for several diseases, such as cardiovascular diseases. Our hypothesis is that extracellular vesicles (EVs) can be potential mechanism of spreading molecules, such as microRNAs, involved with susceptibility to chronic age-related diseases and geriatric syndromes. In this context, the role of microRNAs in age-induced detrimental changes in the cardiovascular system has been suggested. Although EVs can protect microRNAs from endogenous RNAses and internalization of these vesicles into cells is involved with cell communication, delivering microRNAs even to distant tissues, the relationships between EVs microRNAs profile and chronic age-related diseases has not been evaluated. Our aim was to investigate the microRNA profile of circulating EVs during ageing process and their downstream signalling pathways.

Methods: The Ethics Committee (CEUA – Comissão de Ética no Uso de Animais – UFRGS; nr. 29,818) approved all animal procedures and experimental conditions. Male Wistar rats of 3- and 21-month-old were used, and plasma was obtained from the trunk blood. EVs were isolated with ExoQuick following the manufacturer's instructions. microRNA was isolated from EVs and then amplified. microRNA was labelled using the FlashTag Biotin HSR RNA Labelling Kit and profiled on Affymetrix GeneChip microRNA 4.0 Arrays. Ingenuity Pathway Analysis (IPA) was used to identify pathways regulated by significantly altered microRNAs.

Results: Microarray analysis revealed 728 microRNAs. Of these microRNAs, 48 were differentially expressed between aged and young-adult animals, 18 microRNAs were significantly upregulated and 30 were downregulated in aged animals compared to young adult ($p < 0.05$; fold change of $|1.1|$). A conservative filter was applied on IPA and only experimentally validated and highly conserved predicted mRNA targets for each microRNA was used. IPA analysis showed that cardiac hypertrophic signalling is ranked as highly predicted targets for these differentially expressed microRNAs ($p < 0.0001$). Moreover, IPA demonstrated that this canonical pathway is upregulated in aged animals when compared to young adult. In addition to cardiac hypertrophic signalling, other relevant cardiovascular canonical pathways, such as endothelin-1 signalling and intrinsic prothrombin activation pathway have predicted targets.

Summary/Conclusion: Our results showed for the first time that microRNAs profile in circulating EVs has a potential role to drive heart senescence and consequent cardiac diseases which represents the leading cause of death.

Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) Finance Code 001–88881.189257/2018-01; Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) – 307980/2018-9

PS06.04

Endothelial cell-derived extracellular vesicles induce a smooth muscle cell pro-inflammatory phenotype via HMGB1

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