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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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OP2 = PF17

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Chair: Susmita Sahoo – Cardiovascular Research Center, Icahn School of Medicine, Mount Sinai

OP2.01 = PF17.01

Development of scalable processes to produce therapeutic mesenchymal stromal cell-derived extracellular vesicles and their characterization

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Introduction: Despite of high expectations, mesenchymal stromal cell (MSC)-based therapies still lack efficacy, partially due to loss of cell viability and function upon administration. MSC-derived extracellular vesicles (MSC-EV) emulate the regenerative potential of MSC, shifting the field towards cell-free therapies. Clinical applications require the establishment of a scalable and GMP-compliant processes for the production and isolation of MSC-EV, combined with robust characterization platforms.
Methods: To develop a well-established process for the production of therapeutic MSC-EV, we compared different MSC sources (bone marrow, adipose tissue, umbilical cord matrix), culture media compositions (DMEM supplemented with foetal bovine serum (Thermo Fisher Scientific), DMEM supplemented with human platelet lysate (AventaCell Biomedical) and StemPro MSC SFM Xeno Free medium (Thermo Fisher Scientific)) and culture parameters (oxygen tension and shear stress) in two different culture platforms (2D static tissue culture flask vs 3D dynamic spinner vessels). Subsequently, MSC-EV were isolated by ultracentrifugation or a commercially available isolation kit and characterized according to ISEV guidelines.
Results: MSC derived from different sources/donors were able to grow under normoxia and hypoxia in 2D T-flasks and 3D spinner vessel culture systems, while maintaining their immunophenotype and differentiation potential, according to the minimal criteria defined by the ISCT. The time point for pre-conditioning and collection of conditioned medium for MSC-EV isolation was also optimized for both 2D and 3D culture systems. MSC-EV were characterized according to MISEV 2018 guidelines, using techniques as NTA, protein and lipid quantification, western blot, imaging and Fourier-Transform Infrared Spectroscopy (FTIR). The results indicate that MSC-EV derived from different sources/donors have similar size distribution, however, EV yields tend to be higher for the 3D culture system. Of notice, several spectral regions were identified by FTIR, enabling the detection of differences in the biomolecules present in MSC-EV, MSC-conditioned media and cells produced under different conditions.
Summary/Conclusion: In summary, this study contributes to the establishment of a scalable process for MSC-EV production.

OP2.02 = PF17.02

Evaluation of three different isolation methods for small extracellular vesicles from human plasma in prostate cancer diagnosis

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Introduction: Extracellular vesicles (EVs) have great potential in prostate cancer (PCa) diagnosis and progression monitoring to complement the inaccurate prostate specific antigen (PSA) screening and invasiveness of tissue biopsy. However, current methods cannot isolate pure EVs and therefor EVs characteristics remain largely unknown. In order to develop an accurate approach for EV isolation, we aimed to compare three emerging methods with different characteristics of small EVs (sEVs) from human PCa plasma samples and to choose the best one for diagnostic and functional studies
Methods: PCa patients and age-matched healthy controls (HC) plasma (n = 6 in each group) were used to