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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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PS03.01

Proteomic analysis of amniotic fluid-derived exosome cargo reveals a therapeutic potential for regenerative therapies.

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Introduction: Exosomes are being tested for their use as therapeutic agents in degenerative and chronic diseases. However, the optimal source of exosomes is currently under investigation. Amniotic fluid (AF) is a naturally-rich source of exosomes that is easily obtained for use in regenerative medicine. Organicell Flow™ is a minimally-manipulated, acellular product derived from human AF and consist of over 300 cytokines/chemokines as well as exosomes derived from the amniotic membrane and surrounding tissues. We characterized the exosome fraction of our product to elucidate the protein cargo of AF exosomes and demonstrate the therapeutic potential as a novel regenerative therapy.

Methods: The exosome fraction of our product was analysed using Nanosight nanoparticle imaging and MACsplex exosome surface marker array analysis. Exosomes were precipitated using size-exclusion filtration followed by ultracentrifugation from 3 independent products (in triplicate) and subjected to protein lysis and preparation for mass spectrometry analysis using the Easy nLC 1000 and Q Exactive instruments. Tune (version 2.9) and Xcalibur (version 4.1) was used to collect data while Proteome Discoverer (version 2.2) was used to analyse data. Protein expression lists were created by merging the 3 sample replicates together and commonly expressed proteins were determined using Vinny 2.0 vin diagram analysis. WebGestalt tool kit classification system was used to identify top protein function and pathway hits.

Results: Organicell Flow™ contain a mean concentration of 5.24x10^11 particles/mL (n = 12) with a mean mode size of 125.2nm (n = 12). Surface marker analysis confirms the presence of exosome associated proteins CD63, CD81, and CD9 in addition to a high expression of CD133 (n = 3). The completed analysis revealed 1225 commonly detected proteins across 3 products. The top molecular functions of identified proteins included protein-binding, ion-binding, and nucleic acid-binding with enzymes, transcription regulators, and transporter proteins representing the most abundant protein groups. Pathway enrichment analysis revealed top hits for Integrin, PDGF, and P53 pathways. A deeper dive into the enzyme category of the protein cargo further demonstrates the presence of proteins that promote DNA repair such as DNA polymerase (beta and lambda), telomerase reverse transcriptase, and BRCA1.

Summary/Conclusion: Organicell Flow™ characterization demonstrates the therapeutic potential of AF-derived exosomes. Proteomic analysis revealed protein cargo that may regulate various growth factor and cell-cycle associated pathways. Furthermore, the presence of DNA damage response proteins suggests a possible mechanism for induction of cellular repair.

PS03.02

Generation of CAR-T and γδT cell-derived exosomes for future cell free immunotherapies

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Introduction: T cell therapies have predominantly focused on treating cancers, with the more recent example of CAR-T cells targeting CD19+ cells in lymphoma patients. Despite recent success, challenges including demand for reduced off-target toxicities, reduced donor-donor variabilities and the targeting of multiple malignant cell types, still remain.

γδT cells are a subset of T cells with dual innate and adaptive qualities. This duality provides various advantages over their more studied and used counterpart, αβT cells. In the present study, we sought to compare