

ISEV2018 Abstract Book

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 EV. 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 EV research and to advance the understanding of extracellular vesicle biology.

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ISEV is proud to be co-hosting its 2018 Annual Meeting with GEIVEX and is grateful for the contribution of its members to the International Organizing Committee as part of ISEV2018!



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LBS09: Late Breaking Poster Session – Cancer II

Chairs: Valentina Minciacci; Javier Sotillo

Location: Exhibit Hall

17:15–18:30

LBS09.01

Bystander effect of exosomes derived from cervical adenocarcinoma cells in response to irradiation

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Background: Cervical cancer is the second leading cause of cancer deaths among female cancer worldwide. In recent years, cervical cancer is the most prevalent cancer in women in their late 20s to 30s in Japan. We focused on cervical adenocarcinoma which is one of cervical cancers. Cervical adenocarcinoma is reported to be poor prognosis because of difficulty of early detection and of resistance to standard to radiotherapy or chemotherapy. In this study, we investigated the role of extracellular vesicles (EVs) secreted from cervical adenocarcinoma cells in response to irradiation.

Methods: Human cervical cancer (HCA-1) cells were cultured by MEM medium. For the preparation of conditioned media, the culture media was replaced with fresh media supplemented with 10% FBS (depleted of bovine EVs) immediately before treatment with irradiation. Irradiated EVs (IR-EVs) isolation was conducted from the conditioned medium collected 48 h after irradiation (5 Gy). HCA-1 cells were treated with the IR-EVs, to assess the cell viability using WST-1 assay. EVs labelled with PKH26 uptake by HCA-1 cells were analysed by fluorescence microscopy.

Results: HCA-1 cells derived EVs were characterized by the presence of EV marker proteins such as CD9 and CD63. The recipient HCA-1 cells exhibited higher uptake efficiency of the exosomes from the IR (5 Gy)-EVs than the IR (0 Gy)-EVs. We revealed that IR-EVs (5 Gy) reduce cell viability for HCA-1 cells.

Summary/Conclusion: Our data indicated that the bystander effect of exosomes derived from cells in response to irradiation might be existed. Now, we are also investigating characteristics of miRNAs encapsulated in exosomes involved in cell survival.

Funding: This study was partly supported by Society for Women's Health Science Research of Japan.

LBS09.02

Metabolomic profiling of exosomes isolated from serum of head and neck cancer patients after radiotherapy – a preliminary study

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Background: Growing interest in exosomes has resulted in numerous “omics” approaches in search of distinctive molecules. Proteome and transcriptome of exosomes have been widely described and discussed; however, metabolites carried by these vesicles have not been given as much attention. Metabolome analysis of cancer-derived exosomes could provide valuable insight into metabolism changes of cancer cells and tumour microenvironment.

Methods: Exosomes were isolated from serum of healthy volunteers and patients with squamous cell carcinoma. Serum samples from patients were taken before (A) and after (B) radiotherapy. Exosomes were

isolated using size exclusion chromatography. A mixture of MeOH/H₂O was used for extraction of low-molecular metabolites. Next, samples were analysed by gas chromatography-mass spectrometry (GC-MS). **Results:** Comparison of metabolomic profiles of exosomes taken from patients and healthy volunteers revealed metabolite classes common for both groups. The most abundant metabolites were sugars and carboxylic acid derivatives. In addition, amino acids, alcohols, nucleic acids components, amines, carbohydrates and steroid derivatives were found. Nevertheless, most of compounds identified in exosomes were also found in serum itself which was analysed as a control (background). However, changes in the level of several compounds were observed in quantitative assay of exosome metabolome before and after radiotherapy.

Summary/Conclusion: Quantitative and qualitative changes in exosomal metabolome were found after radiotherapy. However, it is worth noting that determination of specific exosomal metabolites is difficult due to overlapping effect of contaminating metabolites of non-exosomal origin present in serum.

Funding: This work was supported by National Science Centre, Poland, Grant no. 2013/11/B/NZ7/01512 and no. 2016/22/M/NZ5/00667.

LBS09.03

Analysing factors resulting in the elevated EV release of pancreatic cancer cells

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Background: Pancreatic ductal adenocarcinoma has a low survival rate due to the late diagnosis and not well-known disease mechanism. The EV-based early detection of pancreatic cancer is based on the idea that cancer cell-derived EVs carry a characteristic molecular pattern and they release EVs at a highly elevated level. Despite intensive efforts, factors increasing EV production from pancreatic cancer cells are not well known yet. By using bioinformatical and experimental approaches, we asked whether gene expression profiles can predict the increased EV release.

Methods: Genes influencing EV production were manually selected. Publicly available gene expression sets were analysed by Gene Set Enrichment Analysis (GSEA). EVs derived from cell lines representing normal pancreatic duct and primary pancreatic ductal adenocarcinoma were studied by antibody-coated magnetic beads and flow cytometry.

Results: KRas or p53 mutations did not result in either the positive or negative enrichment of genes responsible for EV production. Similarly, we found no enrichment of these genes when comparing samples from normal pancreas and pancreatic cancer or pancreatic cancers with different cancer-promoting niche types. Interestingly, pancreatic cancer cell lines produced EVs at a highly elevated level compared to normal pancreatic cells in both 2D and 3D cultures. All four cancer cell lines carried the same mutation in KRas, however, we observed a large heterogeneity in their CD81+ and CD63+ EV production.

Summary/Conclusion: Collectively, our data suggest that the increased EV release of pancreatic ductal adenocarcinoma cells cannot be explained by the general upregulation of genes influencing EV production.

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