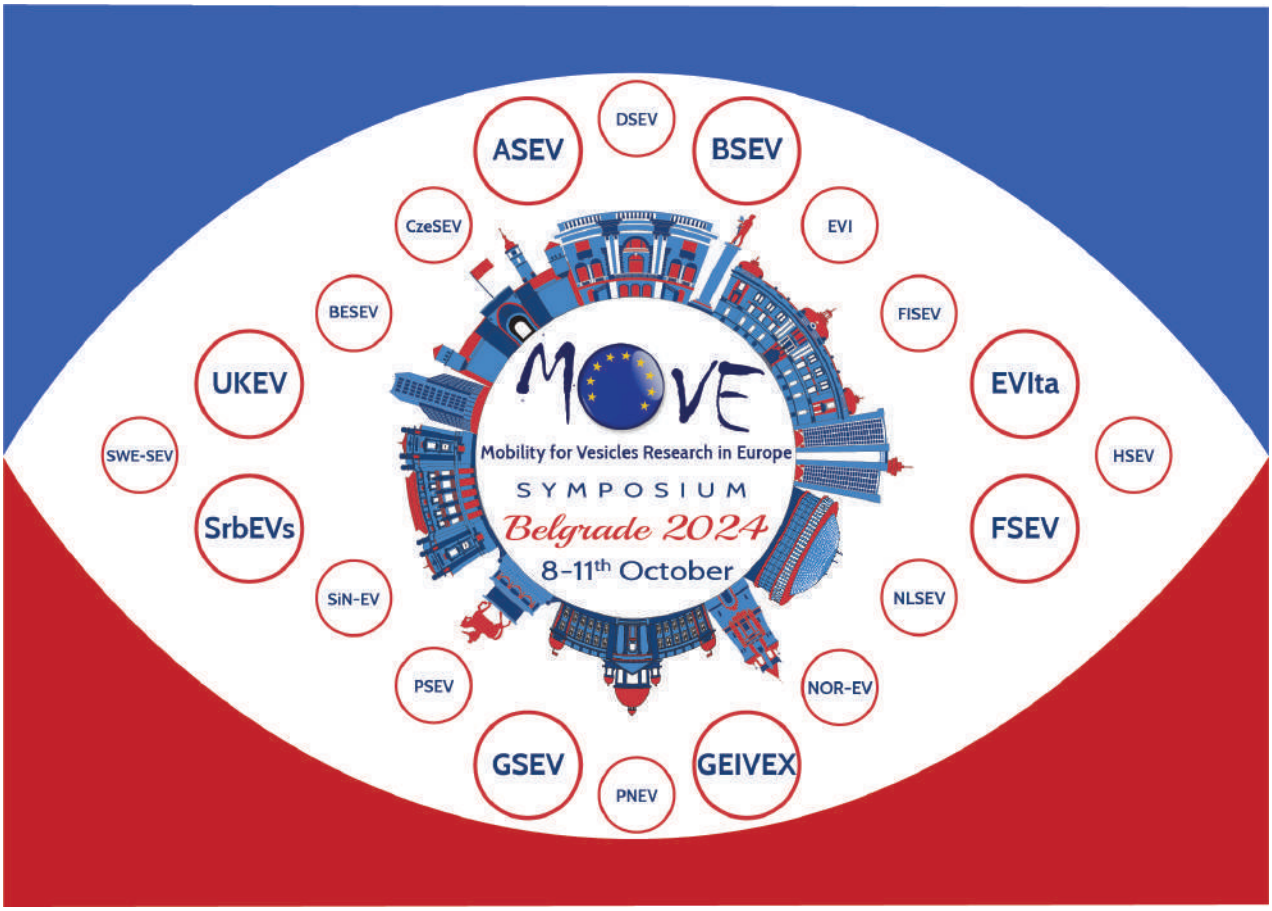
# 2nd MOVE Symposium




*presented by*

European National Societies for Extracellular vesicles

# Abstract book

# 2nd MOVE Symposium

8-11 October 2024, Belgrade, Serbia

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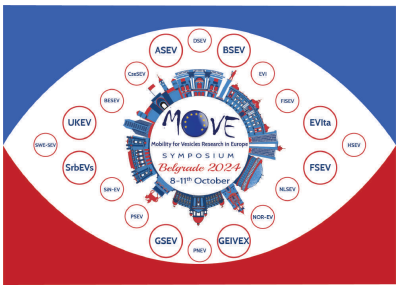


# 2nd MOVE Symposium

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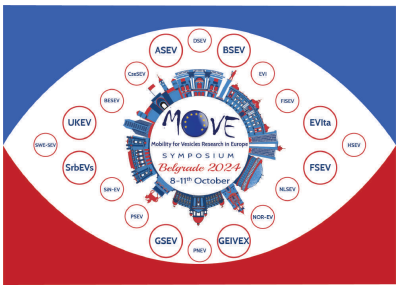


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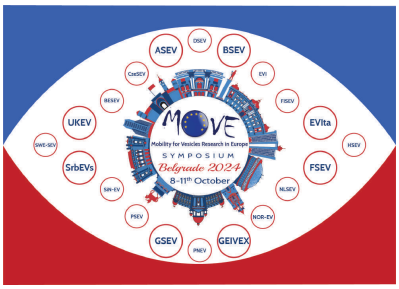


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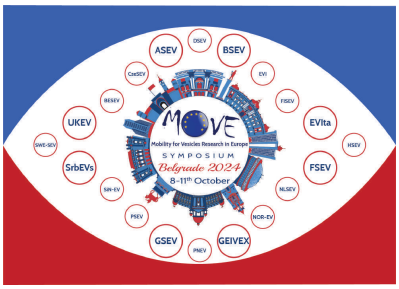


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# 2nd MOVE Symposium

## 8-11 October 2024, Belgrade, Serbia

Dear participants, colleagues and friends,

It's a true pleasure and honor to welcome you to the 2nd MOVE Symposium and its accompanying Abstract Book, on behalf of the International Organizing Committee.

Over the past 15 years, the field of extracellular vesicles (EVs) research has seen remarkable growth, driven by discoveries of their fundamental roles in physiological processes and their potential as biomarkers and therapeutic tools. This progress has highlighted the need for platforms to connect scientists and facilitate knowledge exchange, leading to the establishment of international and national EV societies.

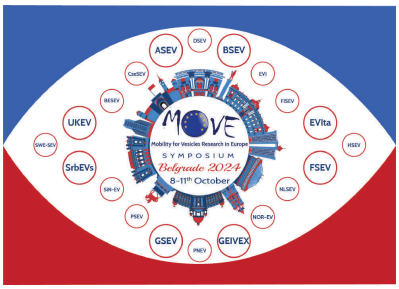
To take the advantage of geographical proximity and expertise, MOVE was formed as an informal consortium of European National EV Societies (NEVS) with the main task to foster MObility for Vesicles research in Europe and encourage communication between the societies aiming to advance and promote EV research and understanding across Europe.

With the same overreaching aim in mind, MOVE expanded its activities to organize 1st MOVE Symposium in Malaga, Spain, in 2023. Four of NEVSs (EV Societies of Spain (GEIVEX), Italy, (EVIta), Germany (GSEV) and United Kingdom (UKEV)), took a lead in organizing this milestone meeting. With more than 350 participants from all over the Europe and topics all across the field of EV research, it was a great success and set the stage for our continued efforts.

This year 8 NEVSs (EV Societies of Serbia (SrbEVs), Austria (ASEV), Baltic countries (BSEV), Italy (EVIta), France (FSEV), Spain (GEIVEX), Germany (GSEV) and United Kingdom (UKEV)), gathered to organize the 2nd MOVE Symposium, in Belgrade, Serbia.

2nd MOVE Symposium featuring 8 keynote lectures from world renown EV scientists, 49 oral presentations and 130 poster presentations across different biological and biomedical disciplines, 10 oral and 17 total presentations of tools for EV research, and over 325 participants from all across the Europe and the world, provides the opportunity to obtain an overview of EV research in Europe and beyond, discover trends and perspectives in EV field and discuss its undiscovered areas and needed research directions.

We hope that 2nd MOVE Symposium will result in formation of fruitful connections between EV enthusiasts and especially provide young scientists with an opportunity to engage with experts and forge lasting relationships that may lead to exciting future projects. As we share a passion for the research of these nano-messengers, fascinating in their complexity, heterogeneity and myriad of roles, we hope this meeting will promote the collaborations and advancements that will help shaping the future of EV research.




# 2nd MOVE Symposium

## 8-11 October 2024, Belgrade, Serbia

In the name of the International Organizing Committee, I'd like to thank all our participants for their contributions to this Program and the Abstract Book, and to all keynote speakers for accepting our invitation to share their expertize.

This event could not have been realized without the collective efforts of our 8 sister societies and I extend my deepest gratitude to the presidents of ASEV, BSEV, EVIta, FSEV, GSEV, GEIVEX, and UKEV as well as their dedicated members on the International Organizing Committee and Scientific Committee.

We are also deeply grateful for the financial support provided by the Sponsors and Supporters of this meeting. We acknowledge that we as scientists cannot do our work without appropriate tools, so we consider industry's contributions and collaborations as invaluable for the development of the field.

We thank Ministry of science, technological development and innovations of the Republic of Serbia for their support. Also, we thank Biological faculty of the University of Belgrade for allowing us to use Indico registration website and we are gratefull to the Institute for the application of the nuclear energy, INEP and Chemical faculty of the University of Belgrade for their kind support in organizing this meeting.

Special thank you are due to the Local Organizing Committee, whose hard work has made this symposium in Belgrade a memorable event. Despite being a relatively young society, SrbEVs has taken the lead with exceptional dedication, providing us with a wonderful setting for this gathering. Also, we are very gratefull to all volunteers within the Technical Committee for their valuable help.

Finally, I hope you will enjoy your time in Belgrade and its municipality of Zemun, and will be inspired to visit again to immerse yourself in its rich culture, history and vibrant city life.

In the name of the International Organizing Committee I wish you all the inspiring and memorable meeting,

Belgrade, October 2024.

Maja Kosanović

President of Serbian Society for Extracellular Vesicles, SrbEVs

# Influence of Trophoblast-Derived Extracellular Vesicles on Atopic Dermatitis-like Keratinocyte Phenotype

**Mirjana Nacka-Aleksić**[1], Andrea Pirković[1], Aleksandra Vilotić[1], Janko Legner[1], Milica Jovanović-Krivokuća[1]

[1]Institute for the Application of Nuclear Energy-INEP, Belgrade, Serbia

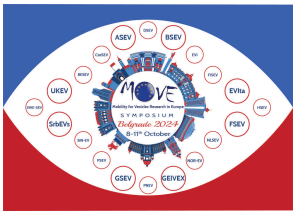
**Introduction:** Atopic dermatitis (AD) is a chronic inflammatory skin condition characterized by intense itching, erythema, and eczema. The pathogenesis of AD involves a complex interplay between genetic, environmental, and immunological factors, leading to skin barrier dysfunction and immune dysregulation. Recent studies suggest that extracellular vesicles derived from placental trophoblast cells (TEVs), may have immunomodulatory properties. This study investigates the effects of TEVs on keratinocytes treated with a cocktail of pro-inflammatory cytokines (TNF-α, IFN-γ, and IL-4) implicated in the pathogenesis of AD.

**Methodology:** TEVs were isolated from culture medium conditioned by immortalized first-trimester extravillous trophoblast HTR-8/SVneo cells and cultured for 24 h with immortalized human keratinocyte HaCaT cells. TEV-pretreated HaCaT cells were then exposed for 5 h to AD-like cytokine environment. Finally, cell viability (MTT assay), reactive oxygen species (ROS) production , pro-inflammatory cytokines' and filaggrin expression levels (cell-based ELISA assay) were determined.

**Results:** The MTT assay indicated that both AD-like cytokine coctail (TNF-α, IFN-γ, and IL-4) and TEVs significantly stimulated the metabolic activity of HaCat cells and, consistently, production of ROS. Additionally, protein expression of IL-6, IL-8, and IL-1β (cytokines released by keratinocytes in AD) and filaggrin (a key molecule implicated in skin barrier function and pathogenesis of AD) also altered upon both AD-like cytokines' and TEV stimulation.

**Conclusion:** The findings indicate that TEVs may not be suitable for mitigating AD-like phenotype in keratinocytes and potentially other inflammatory skin diseases. On the other hand, the results suggest TEVs' potential regenerative properties, which could be harnessed for therapeutic purposes in wound healing or aging-related skin conditions. Future studies should focus on elucidating the range of immunomodulatory and/or regenerative effects of TEVs and their efficacy in models of skin disorders.

**Funding:** Ministry of Science, Technological Development and Innovation, Republic of Serbia (Grant No. 451-03-66/2024-03/200019).



P-T-14

# Extracellular Vesicles from Extravillous Trophoblast Modulate D-galactosis-Induced Keratinocyte Senescence

**Milica Jovanović-Krivokuća**[1], Aleksandra Vilotić[1], Andrea Pirković[1], Janko Legner[1], Mirjana Nacka-Aleksić[1]

[1]Institute for the Application of Nuclear Energy-INEP, Belgrade, Serbia

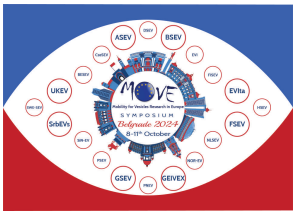
**Introduction:** Placenta-based skincare products have gained popularity and are advertised for their potential benefits in modern skincare. Previous work has shown that placenta-derived products can effectively reduce skin senescence, but few studies have specifically focused on the role of trophoblast-derived extracellular vesicles (TEVs) in that context.

**Methodology:** In this study, extracellular vesicles derived from immortalized first-trimester extravillous trophoblast HTR-8/SVneo cells were isolated from conditioned cell culture medium, and their ability to modulate D-galactose-induced senescence of HaCaT keratinocytes was assessed. Key analyses included keratinocyte proliferation and the expression of mammalian target of rapamycin (mTOR), β1 integrin subunit and involucrin.

**Results:** Keratinocytes treated with D-galactose exhibited upregulated mTOR, marker of senescence, indicating a shift towards a senescent phenotype. Additionally, the effects of D-galactose treatment on the β1 integrin subunit, which plays a vital role in cell adhesion and signal transduction, and involucrin, a marker of keratinocyte differentiation, further affirmed the impact on cellular senescence and differentiation pathways. Pretreatment of keratinocytes with TEVs revealed their modulating effect on senescence-associated markers.

**Conclusions:** Our results suggest that TEVs may possess anti-aging properties, potentially through the delivery of bioactive molecules that counteract the effects of D-galactose. These findings open avenues for further research into putative TEV regenerative action, which could be harnessed for therapeutic purposes in wound healing and senescence-related skin conditions.

**Funding:** Ministry of Science, Technological Development and Innovation, Republic of Serbia (Grant No. 451-03-66/2024-03/200019).




P-T-15

# The Effects of Extravillous Trophoblast Cell-Derived Extracellular Vesicles on Cell Viability and Cisplatin Response in Choriocarcinoma Cells

Mirjana Nacka-Aleksic[1], Aleksandra Vilotic[1], Ninoslav Mitic[1], Filip Janjic[1], **Andrea Pirkovic**[1]

[1]Institute for the Application of Nuclear Energy-INEP, Belgrade, Serbia

**Introduction:** Extracellular vesicles (EVs) released from the placenta are increasingly being explored as a new approach to cancer treatment. They are being examined for their role in regulating proliferation and invasion, although the exact mechanism of modulating cancer cell function remains largely unknown. The study aimed to evaluate if trophoblast cells' EVs (TC-EVs) could influence viability and metabolic function of choriocarcinoma cells (JAR) and whether they could sensitize cells *in vitro* to the effects of cisplatin (CisP) as a known anti-cancer therapeutic.

**Methods:** TC-EVs were isolated from conditioned media of healthy human extravillous trophoblast cells HTR-8/SVneo, by ultracentrifugation. JAR choriocarcinoma cells were treated with 1 µM CisP and/or TC-EVs (50 µg/mL protein) for 24h. Cell viability and levels of reactive oxygen species (ROS) were determined by MTT and H2DCFDA assays, respectively. DNA damage was evaluated by detecting γ-H2AX foci using immunofluorescent staining.

**Results:** Significant inhibition of JAR cells' viability was observed in monotreatment with TC-EVs as well as with CisP, while the most pronounced cytotoxicity was achieved in co-treatment. ROS production was significantly increased in cells after 24h co-treatment with TC-EVs and CisP compared to control cells, while there were no significant changes in the monotreated cells. In terms of DNA damage, TC-EVs, CisP and combination of TC-EVs with CisP produced 40.56%, 70.15% and 72.30% cells positive for γ-H2AX foci in nuclei, respectively.

**Conclusion:** We have demonstrated that TC-EVs used as concomitant treatment with CisP were able to influence the metabolic activity of choriocarcinoma cells. The results showed a greater response to cytotoxic drug treatment and increased production of ROS, while DNA damage levels were similar. Although TC-EVs may represent a mean to sensitize tumor cells to chemotherapy, further work is required to establish whether these effects could be translated in the *in vivo* setting.

**Funding information**: Study was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Agreement no. 451-03-66/2024-03/200019)

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