

FIRST WORLD CONGRESS ON

# Targeting Extracellular Vesicles

Mitochondria and Microbiota:  
Crucial Impact

OCTOBER, 17<sup>TH</sup> & 18<sup>TH</sup> 2024 - MALTA



TARGETING  
**E**XTRACELLULAR  
**V**ESICLES

International Society  
of **m**icrobiota

[www.targeting-exosomes.com](http://www.targeting-exosomes.com)

# First World Conference Targeting Extracellular Vesicles

Day 1 – Thursday October 17, 2024

8h00 **Materials Distribution & Welcoming of Attendees**

8h50 **Welcome Note: Why Targeting EVs Meeting?**

*Marvin Edeas, Volkmar Weissig, Ramaroson Andriantsitohaina, Devika S. Manickam, Carla Lopes, and Didier Serteyn*

## Session 1: Extracellular Vesicles & Mitochondria

*Presentations duration: 25 minutes + 5 minutes Q&A.*

*Moderators: Devika Manickam, Marvin Edeas*



9h00 – Keynote Speech:

**Mitochondria and Extracellular Vesicles: Recent Discoveries & Challenges**

**Devika S. Manickam**, Duquesne University, USA



9h30 – **The Role of Mitovesicles in the Brain with Mitochondrial Dysfunction**

**Efrat Levy**, NYU Grossman School of Medicine, USA



10h00 – **Mitochondrial DAMPs in EVs: Triggering Early Neuroinflammation in Neurodegeneration**

**Carla Lopes**, University of Coimbra, Portugal

*10h30 – 11h15 Coffee Break, Networking, & Poster Session*



11h15 – **Liposomes & Exosomes: Lessons & Perspectives**

**Volkmar Weissig**, Midwestern University, College of Pharmacy Glendale, USA



11h25 – **Engineering Exosomes for Precise Mitochondrial Targeting in Brain Cells: Expanding the Frontiers of Cellular Communication and Therapeutics**

**Lanrong Bi**, Michigan Technological University, USA



11h55 – **Cancer-related Extracellular Vesicles in relation to Mitochondria, Microbiota and More**

**Lorraine O'Driscoll**, Trinity College Dublin and Trinity St. James's Cancer Institute, Ireland

*12h25 – 14h00 Lunch Break, Networking, & Poster Session*

*Moderators: Efrat Levy, Carla Lopes*



14h00 – **Extracellular Vesicle Release of Mitochondria in Response to Lysosomal Dysfunction**

**Åsa B. Gustafsson**, University of California San Diego, USA



14h30 – **Delivery of Mitochondria-Containing EVs to the Blood-Brain Barrier**  
**Devika S. Manickam**, *Duquesne University, USA*



15h00 – **New strategies for the targeting of central regulation of obesity with a nanotechnology approach using engineered extracellular vesicles**  
**Ramaroson Andriantsitohaina**, *University of Montpellier, France*

15h30 – 16h15 Coffee Break, Networking, & Poster Session



16h15 – **Exploring the Capabilities of Exosomes from Muscle-Derived Mesenchymal Stem Cells: Insights into Immunomodulation and Mitochondrial Transfer**  
**Didier Serteyn**, *Université de Liège, Belgium*

#### 16h45 Short Oral Presentations & Innovations

**Mitochondrial Cargo Determines Paracrine Effects of Endothelial-Derived Extracellular Vesicles**  
*Zahid Manzar, University at Buffalo-SUNY, USA*

**Identification of Mitochondrial Exosome as an Escape Mechanism of Mitochondrial DNA in a Cardiac *in vitro* Model of Lipotoxicity**  
*Mónica Velásquez-Esparza, Escuela de Medicina y Ciencias de la Salud, Tecnológico de Monterrey, Mexico*

**Extracellular Vesicles as Alternative Modulators of Mitochondria Quality Control in Skin Aging and Disease**  
*Maria Cavinato, University of Innsbruck, Austria*

**Exosomal Chaperons – Emerging Biomarkers for Cancer Diagnosis, Prognosis and Treatment**  
*Wioletta Baranska-Rybak, Medical University of Gdańsk, Poland*

**Impact of Plant-Derived Nanovesicles on Bioenergetic Activity in Skin Inflammation**  
*Gabrielė Kulkovienė, Lithuanian University of Health Sciences, Lithuania*

**Extracellular Vesicles Secreted By GDF15-Depleted Fibroblasts Modulate Skin Homeostasis**  
*Ines Martic, University of Innsbruck, Austria*

**Proteomic and Biological Profiling of Mitochondria-Containing Extracellular Vesicles from Neural Progenitor Cells (NPCs) Derived From an Alzheimer's Disease Patient**  
*Tingting Chen, University of Groningen, The Netherlands*

**Exosomal Heat Shock Proteins in Melanoma – Potential Prognostic Markers and Therapeutical Targets**  
*Magdalena Gorska-Ponikowska, Medical University of Gdańsk, Poland*

#### Other Contributions – Poster Presentations (On both days)

**1. The Role of Exosomes in Tumor Progression and Therapy Resistance**  
*Julia Federspiel, Medical University of Innsbruck, Austria*

**2. Extracellular Vesicles as a Response Biomarker in Patients with Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)**  
*Sheila Gato, Universidad de Sevilla, Spain*

**3. Effects of Mitochondrial Dysfunction in Organotypic Slice Cultures**  
*Maria do Carmo Greier, Medical University of Innsbruck, Austria*



#### 4. The Investigation of Glioblastoma-Derived Extracellular Vesicles Effect on Cells in the Cardiovascular System

Deimantė Kulakauskienė, Lithuanian University of Health Sciences, Lithuania

#### 5. Role of Plant-Derived Extracellular Vesicles in Modulating Bioenergetic and Metabolic Activity during Viral Inflammation

Emilija Mikalauskiene, Lithuanian University of Health Sciences, Lithuania

#### 6. Impact of Virus Mimetic Poly(I:C)-Primed Airway Extracellular Vesicles on Microglial Mitochondrial Structure and Function

Deimantė Naruskaitė, Lithuanian University of Health Sciences, Lithuania

#### 7. Platelet-Derived Extracellular Vesicles (PEVS) as a Potential Biomarker for Hepatocellular Carcinoma (HCC)

Ángela Rojas, Universidad de Sevilla, Spain

#### 8. Stem Cell-Derived Exosomes Increase the Survival of Irradiated Mouse NSCS *in vitro* and Alleviate Cranial Radiation-Induced Cognitive Dysfunction

Mariia Ratushnyak, National Research Centre "Kurchatov Institute", Russia

18h05 – 18h35

## A Crucial Debate on the Future of Extracellular Vesicles: Key Questions & What's Next?

After the presentations, speakers and scientific committee members will be invited for an in-depth debate and Q&A session, where we will address meticulously chosen, high-quality questions designed to focus on the most significant and impactful issues, rather than technical details.

### **Standardization and Protocols**

- What are the main challenges preventing the standardization of EVs in research and clinical applications?
- What steps are being taken by the scientific community to develop standardized protocols for EV and exosome research?

### **Targeting and Delivery**

- What are the current methods used to target EVs to specific organs or tissues?
- How can surface modifications on EVs enhance their targeting efficiency?
- What role do ligands and receptors play in the targeted delivery of EVs and exosomes?
- How does the microenvironment of specific tissues influence the uptake of EVs?

### **Mitochondrial Function, Dysfunction and Therapeutic Applications**

- How do EVs contribute to the optimization of mitochondrial function through whole mitochondria, mitovesicles, protein, and genetic material transfer?
- What are the mechanisms by which EVs can spread damaged mitochondrial components, and how does this affect disease progression?
- How can mitochondrial dysfunction impact the EVs cargo loading and their impact on the target cells?
- How do we control the quality and quantity of mitochondria entrapped in cell-derived EV? Robust characterization of mitochondrial content in EVs: tools and technologies.
- How can EVs be used as vehicles for different cargo and drugs?

18h35 **End of Congress Day 1**

20h15 **Meet the Speakers Dinner** (*Reserved for ticket holders only*)  
Summer Kitchen, Corinthia Palace, Malta

# First World Conference Targeting Extracellular Vesicles

Day 2 – Friday October 18, 2024

8h00 **Materials Distribution & Welcoming of Attendees**

8h25 **Opening of Day 2**

## Session 2: Microbiota & Extracellular Vesicles

*Presentations duration: 25 minutes + 5 minutes Q&A.*

*Moderators: Justus Reunanen, Ramaroson Andriantsitohaina*



8h30 – **Microbiota-Derived Extracellular Vesicles in Maternal-Fetal Communication: What We Know?**  
**Justus Reunanen**, University of Oulu, Finland



9h00 – **Lactobacilli Extracellular Vesicles: Potential Postbiotics to Support the Vaginal Microbiota Homeostasis**  
**Carola Parolin**, University of Bologna, Italy



9h30 – **Gut-Microbiome Derived Extracellular Vesicles in Cancer**  
**Surbhi Mishra**, University of Oulu, Finland

*10h00 – 10h45 Coffee Break, Networking, & Poster Session*



10h45 – **Therapeutic Applications of Microbial Extracellular Vesicles**  
**Steven Jay**, University of Maryland, USA



11h15 – **Modulation of Phage-Microbe interactions and Antimicrobial Resistance by Bacterial Extracellular Vesicles**  
**Meta Kuehn**, Duke University, USA



11h45 – **The gut microbe-derived extracellular vesicles - mitochondria axis in mental disorders: Strengths and weaknesses of new studies**  
**Seyed Davar Siadat**, Pasteur Institute of Iran, Iran

*12h15 – 13h45 Lunch Break, Networking, & Poster Session*



13h45 – **Role of Stem Cell-Derived Extracellular Vesicles to Promote Successful Aging**  
**Consuelo Borrás**, University of Valencia, Spain



14h15 – **Bioinspired, Fully Synthetic Extracellular Vesicles to Optimize Wound Healing**  
**Joachim Pius Spatz**, University of Heidelberg, Germany

#### 14h45 Short Oral Presentations & Innovations

##### **Differential Transcriptomic Profile in Platelet-Derived Extracellular Vesicles in Patients with Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)**

*Vanessa Garcia-Fernandez, Universidad de Sevilla, Spain*

##### **CD34+Microparticles Affect the Apoptotic Mechanism of Mononuclear Cells Derived from Umbilical Cord Blood and HL60 Cells**

*Angeliki Xagorari, G.Papanikolaou Hospital, Greece*

##### **Testing the Potency of Extracellular Vesicles derived from Differentiating Mesenchymal Stem Cells with an Adapted Wound Assay**

*Edda Tobiasch, Bonn-Rhein-Sieg University of Applied Sciences, Germany*

##### **Proteomic Analysis of Fecal Extracellular Vesicles in Young and Old Mice**

*Khalyfa Abdelnaby, Marshall University, USA*

15h25 – 16h00

## A Crucial Debate on the Future of Extracellular Vesicles: Key Questions & What's Next?

### **General Feasibility and Challenges**

- Why is using EVs as biomarkers still considered far from reality?
- What are the key challenges in isolating and identifying specific EVs as disease markers?

### **Technological and Methodological Advancements**

- How can advances in high-throughput technologies improve the feasibility of using EVs as biomarkers?
- How can multi-omics approaches enhance the reliability of EVs as diagnostic tools?

### **Biological and Therapeutic Applications**

- How can we best select cells for isolating EVs for therapies?
- What are the critical components of EVs that contribute to biological effects (proteins vs RNAs vs metabolites/other)?
- What are the potential advantages of using EVs over traditional biomarkers?
- What potential biomarkers can be identified from microbiota-derived EVs for immune modulation?

### ***Microbiota and Microbial Interactions***

- How can understanding microbiota-derived EVs lead to new therapeutic strategies for managing microbiota-related diseases?
- How do microbiota-derived EVs facilitate communication between microbial communities and host cells?
- How do we consider phage and viruses when developing EVs as therapeutics?
- How can we use our understanding of how EVs help bacteria adapt to antimicrobials in the environment to combat antimicrobial resistance?

### ***Novel Hypotheses and Speculative Questions***

- What if extracellular vesicles could orchestrate and revolutionize communication between mitochondria, human cells, and the microbiome?

**16h00 Targeting EVs 2024 Concluding Remarks & Awards**

**16h15 Networking Accompanied by Drinks and Appetizers**

