

2024 CONFERENCE & SCHOOL ON EXTRACELLULAR VESICLES AND NANOPARTICLES (CSEVP-2024)

ROME
UNIVERSITY OF ROME TOR VERGATA
DECEMBER 2ND – 4TH, 2024



General Organization Committee

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Scientific Committee

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School Organization Committee

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Dr. Simone Dinarelli, Istitute for the Structure of Matter, CNR, Rome, Italy
Prof. Paola Lanuti, University of Studies G. d'Annunzio Chieti and Pescara, Chieti, Italy

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BACKGROUND

All cells release extracellular vesicles and nanoparticles into the extracellular environment during physiological and pathophysiological processes (cancer, diabetes, arthritis, etc.). Extracellular vesicles are lipid bilayer-enclosed nanosized particles that are released by cells in the extracellular milieu and cannot replicate, i.e., are devoid of a functional nucleus.

They are of two types: vesicles that are free to migrate to other regions of a tissue, or even to other tissues, after their release (media vesicles), and vesicles that bind to the extracellular matrix and are less inclined to migrate (matrix vesicles). The current model describes the main function of media vesicles as participation in paracrine and endocrine cell-cell communication processes, while the main function of matrix vesicles as participation in mineralization processes.

Extracellular nanoparticles include not only well-known entities, such as lipoprotein particles, nucleosomes, and vaults, but also two recently discovered nanoparticles, exomeres and supermeres. Although their biological function is not yet clear, exomeres and supermeres are thought to be exclusively capable of migration and their main function is described to be participation in cell-cell communication.

DESCRIPTION OF THE EVENT

The aim of the 2024 Conference & School on Extracellular Vesicles and Nanoparticles (CSEVP-2024) is to bring together young and senior experts in the field of extracellular vesicles and nanoparticles and stimulate discussion on the state of the art and challenges in the field.

December 2nd

The first day of the event will be characterized by the 2024 Conference on Extracellular Vesicles and Nanoparticles. The conference is the sixth edition of the International Conference of Matrix Vesicles (ICMV), whose first edition was in Rome in 2018*[1], expanding its topics to all types of extracellular vesicles and nanoparticles. Senior experts will highlight recent advances in understanding the role of extracellular vesicles and nanoparticles in physiological and pathological processes, as well as recent advances in their use in nanomedicine. A session will also be dedicated to young scientists (the "rising stars") who will present their research through oral and poster presentations. Prizes from the Italian Society for the Extracellular Vesicles, Zanichelli and Acoerela will be awarded to young scientists for best oral communication and best poster presentation. During the day there will also be interventions from private companies, including ONI, Beckman Coulter, IZON, CytoViva and Particle Metrix GmbH, who will briefly present the state of the art in instrumentation for the purification and characterization of cell-derived vesicles and nanoparticles.

The conference is endorsed by the International Society for Extracellular Vesicles (ISEV).

The abstracts of the 2024 Conference on Extracellular Vesicles and Nanoparticles will be published on the Journal of Extracellular Biology (Wiley).

December 3rd and 4th

The second and third day of the event will feature the 2024 School on Extracellular Vesicles and Nanoparticles with theoretical and practical lessons on topics related to the isolation of extracellular vesicles and nanoparticles and their characterization.

The school will be by invitation and the places available will be limited (max 12): students who wish to attend the school must send their CV through the dedicated website. **The first day of the school (December 3rd)** will be held in the laboratories of the Department of Experimental Medicine (Nanomedicine Lab- Prof. Massimo Bottini and Microbiology and Clinical Microbiology laboratory- Prof. Claudia Matteucci) of the University of Rome Tor Vergata. First, there will be theoretical lessons about general aspects of cell-derived vesicles and nanoparticles (lesson held by Prof. Saida Mebarek, Université Claude Bernard Lyon 1, Villeurbanne, France) and their characterization (lesson held by Prof. Paola Lanuti, University of Studies G. d'Annunzio Chieti and Pescara, Chieti, Italy). Next, three will be practical lessons about the isolation procedures of cell-derived vesicles and nanoparticles using size-exclusion chromatography (lesson held by IZON) and their characterization using such techniques as Tunable Resistive Pulse Sensing (lesson held by IZON), Nanoparticle Tracking Analysis (lesson held by Particle Metrix GmbH), Hyperspectral Microscopy (lesson held by CytoViva), High Resolution Imaging (lesson held by ONI) and Flow Cytometry (lesson held by Beckman Coulter).

The second day of the school (December 4th) will be held at the Institute for the Structure of Matter (ISM) of the National Research Council. There will be theoretical lessons about the fabrication and characterization of biomimetic structures of extracellular vesicles based on proteoliposomes (lesson held by Prof. Pietro Ciancaglini, Universidade de São Paulo, Ribeirão Preto, Brazil) and theoretical (held by Dr. Marco Girasole and Dr. Giovanni Longo, ISM, CNR, Italy) and practical lessons (held by Dr. Simone Dinarelli, ISM, CNR, Italy) about the characterization of extracellular vesicles and nanoparticles using Atomic Force Microscopy.

PROGRAM

December 2nd, 2024

Conference

Fleming Hall – Rome Tor Vergata University

07:30 – 08:30 Registration

08:30 – 08:35

WELCOME TALK TO THE 2024 CONFERENCE & SCHOOL ON EXTRACELLULAR VESICLES AND NANOPARTICLES

Prof. Nathan Levialdi Ghiron – Rector of the University of Rome Tor Vergata

08:35 – 09:00

Moderators: Prof. Bottini M. & Prof. Matteucci C.

Keynote Speaker - Prof. Millán J.L. - Sanford Burnham Prebys, La Jolla, USA

MATRIX VESICLES FUNCTION DURING PHYSIOLOGICAL MINERALIZATION AND ECTOPIC CALCIFICATION

09:00 – 10:00

Session 1

MEDIA VESICLES

09:00 – 09:20

MACROPHAGE-DERIVED EXTRACELLULAR VESICLES ALTER POLARIZATION OF RECIPIENT MACROPHAGES AND SKELETAL MUSCLE HOMEOSTASIS IN A HYPER-GLUCOSE ENVIRONMENT

Prof. Dini L. - University of Rome Sapienza, Italy

09:20 – 09:40

Lipototoxicity: a new role of lipid cargo in Extracellular Vesicles from Lipid Associated Macrophages

Dr. Tacconi S. - INSERM, France and University of Rome La Sapienza, Italy

09:40 – 10:00

HIGH SENSITIVITY FLOW CYTOMETRY FOR THE ANALYSIS OF EXTRACELLULAR VESICLES: NEW DEVELOPMENTS IN THE RESEARCH AND CLINICAL APPLICATION

Dr. Radu C.M. - University of Padua, Italy

10:00 – 10:20 - Coffee break

10:20 – 11:40

Session 2

MATRIX VESICLES

10:20 – 10:40

THE DIFFERENCE BETWEEN MEDIA AND MATRIX VESICLES AS A POSSIBLE DIAGNOSTIC TOOL TO MONITOR THE PROGRESSION OF CARDIOVASCULAR AND SKELETAL DISEASES

Prof. Strzelecka-Kiliszek A. Polish Academy of Sciences, Poland

10:40 – 11:00

MATRIX VESICLE SECRETION AND MOLECULAR COMPOSITION IS REGULATED BY PHOSPHATE ION

Prof. Napierala D. - University of Pittsburgh, USA & Polish Academy of Sciences, Poland

11:00 – 11:20

MATRIX VESICLES: INSIGHTS INTO COMPOSITION AND PROSPECTIVE THERAPEUTIC APPLICATIONS

Prof. Davies O. - Loughborough University, UK

11:20 – 11:40

DECELLULARIZED WHARTON'S JELLY (DWJ) AS A SOURCE OF MATRIX-BOUND NANOVESICLES (MBVS): NEW FRONTIERS IN THE TREATMENT OF INTERVERTEBRAL DISC DEGENERATION

Prof. Penolazzi L. - University of Ferrara, Italy

11:40 – 12:40

Session 3

NEWS AND RESEARCH - SPONSOR TALKS

11:40 – 11:55 - ONI

11:55 – 12:10 Beckman Coulter

12:10 – 12:25 IZON

12:25 – 12:40 Particle Metrix

12:40 – 14:00 Buffet lunch - Poster Session, Sponsor Exhibition

14:00 – 14:20

Moderators: Prof. Mebarek S. & Dr. Minutolo A.

KEYNOTE SPEAKER - **PROF. ANNALISA RADEGHIERI** – UNIVERSITY OF BRESCIA, ITALY
BEYOND THE SURFACE: DELVING INTO BIOMOLECULAR CORONA AND BIOGENIC NANOPARTICLES

14:20 – 15:00

Session 4

MEDIA VESICLES

14:20 – 14:40

DJ-1 REGULATES INTERCELLULAR COMMUNICATION VIA EXTRACELLULAR VESICLES IN OXIDATIVE STRESS.

Prof. Repici M. - Aston University, UK- Parkinson's associated protein

14:40 – 15:00

EXTRACELLULAR VESICLES FROM TREGS: A NOVEL APPROACH TO IMMUNOMODULATORY THERAPIES

Dr. Simeone P. G. - D'Annunzio University, Italy

15:00 – 18:15

Session 5

RISING STARS

15:00 – 15:15

EVALUATING THE STABILITY OF MSC-EVS FOR ORAL DELIVERY

Dr. Belaid M. - King's College, UK & Singapore

15:15 – 15:30

SMALL EXTRACELLULAR VESICLES PROPAGATING NEURODEGENERATIVE MRNAS IN ALZHEIMER'S DISEASE

Dr. Cavarlez M.J. - Sanford Burnham Prebys, CA

15:30 – 15:45

EXPLORING ANTITUMOR ACTIVITY OF B7-H3 CAR-T-DERIVED EXTRACELLULAR VESICLES IN PANCREATIC CANCER CELLS

Dr. Florio R. G. - D'Annunzio University, Italy

15:45-16:15 coffee break

16:15 – 16:30

EVALUATION OF MYELOID ACTIVATION MARKERS IN BLOOD CELLS AND CIRCULATING EXTRACELLULAR VESICLES AS NEW TOOL FOR MONITORING SARS-COV-2 INFECTION AND LONG COVID ASSOCIATED SEQUELAE

Dr. Fanelli M. - University of Rome Tor Vergata, Italy

16:30 – 16:45

HSV-1 INFECTION INDUCES PHOSPHORYLATED TAU PROPAGATION AMONG NEURONS VIA EXTRACELLULAR VESICLES

Dr. Protto V. - ISS, Italy

16:45 – 17:00

USE OF AFM NANOINDENTATION FOR EXTRACELLULAR VESICLE DETECTION AND BIOGENESIS ANALYSIS: A NOVEL MATLAB-BASED APPROACH

Dr. Collacchi F. - CNR, Italy

17:00 – 17:15

CABBAGE-DERIVED EXOSOME: AN INNOVATIVE PURIFICATION METHOD AND POTENTIAL APPLICATIONS IN PHARMACEUTICAL AND COSMECEUTICAL FIELDS

Dr. Zanotti C. - University of Rome Tor Vergata, Italy

17:15 – 17:30

SMALL-RNAS CARRIED BY OUTER MEMBRANE VESICLES: A (NOVEL) COMPLEX MECHANISM TO REGULATE THE INFECTION PROCESS OF HLYF-POSITIVE SHIGA TOXIN-PRODUCING ESCHERICHIA COLI STRAINS

Dr. Barbieri C. - ISS, Italy

17:15 – 18:15 Awards and Concluding remarks

Scientific Committee

SCHOOL on EVS

December 3rd, 2024

Finazzi Agro' Hall - School on EVs

08:00 Registration

08:30

Prof. Massimo Bottini & Prof. Claudia Matteucci

WELCOME TALK TO THE SCHOOL ON EVS

08:30 – 09:00

INTRODUCTION ON EXTRACELLULAR VESICLES

Prof. Saida Mebarek - Université Claude Bernard Lyon 1, Villeurbanne, France

09:00 – 09:30

MINIMAL INFORMATION FOR STUDIES OF EXTRACELLULAR VESICLES (MISEV)

Prof. Paola Lanuti - University of Studies G. d'Annunzio Chieti and Pescara, Chieti, Italy

09:30 – 13:00

School on EVs: Bottini's Lab (Group 1)

- Isolation of EVs by SEC (IZON)
- Characterization of EVs by TRPS (IZON)
- Characterization of EVs by NTA (Particle Metrix)
- Characterization of EVs by hyperspectral imaging (CytoViva)
- Characterization of EVs by high resolution microscopy (ONI)

School on EVs: Matteucci's Lab (Group 2)

Isolation and characterization of EVs by flow cytometry (Beckman Coulter)

13:00 – 14:00 - Buffet lunch

14:00 – 17:30

School on EVs: Matteucci's Lab (Group 1)

- Isolation and characterization of EVs by flow cytometry (Beckman Coulter)

School on EVs: Bottini's Lab (Group 2)

- Isolation of EVs by SEC (IZON)
- Characterization of EVs by TRPS (IZON)
- Characterization of EVs by NTA (Particle Metrix)
- Characterization of EVs by hyperspectral imaging (CytoViva)
- Characterization of EVs by high resolution microscopy (ONI)

December 4th, 2024

CNR Tor Vergata – School on EVs

8:30 - 9:00

THEORY ON ATOMIC FORCE MICROSCOPY IN BIOMEDICINE

Dott. Marco Girasole - Istitute for the Structure of Matter, CNR, Rome, Italy

9:00 - 11:00

SCHOOL ON EVS: THEORETICAL SESSION (GROUP 1)

Prof. Pietro Ciancaglini - Universidade de São Paulo, Ribeirão Preto, Brazil

- Proteoliposomes as biomimetic systems of extracellular nanoparticles
- Dott. Giovanni Longo** - Istitute for the Structure of Matter, CNR, Rome, Italy
- The nanomotion sensor: a versatile tool in biomedicine

SCHOOL ON EVS: BIOTECH@ISM LAB (GROUP 2)

Dott. Simone Dinarelli - Istitute for the Structure of Matter, CNR, Rome, Italy

- Characterization of extracellular nanoparticles by atomic force microscopy

11:00 - 13:00

SCHOOL ON EVS: BIOTECH@ISM LAB (GROUP 1)

Dott. Simone Dinarelli - Istitute for the Structure of Matter, CNR, Rome, Italy

- Characterization of extracellular nanoparticles by atomic force microscopy

SCHOOL ON EVS: THEORETICAL SESSION (GROUP 2)

Prof. Pietro Ciancaglini - Universidade de São Paulo, Ribeirão Preto, Brazil

- Proteoliposomes as biomimetic systems of extracellular nanoparticles
- Dott. Giovanni Longo** - Istitute for the Structure of Matter, CNR, Rome, Italy
- The nanomotion sensor: a versatile tool in biomedicine

13:30 CLOSING LAB SCHOOL

PARTICIPATION

Free
on site and online
Qrcode // www.csevp.it



VENUE

Conference (2 December)
Fleming Hall
Tor Vergata University
Via Montpellier 1 - Rome

School (3 December)
Finazzi Agro' Hall
Tor Vergata University
Via Montpellier 1 - Rome

School (4 December)
CNR - ARTOV
Via del Fosso del Cavaliere 100 - Rome