



SZABO  
SCANDIC

Part of Europa Biosite

*presents*

# Research Afternoon - Hot Trends in Science

## Program

*April 18<sup>th</sup>, 2024*

### Topic: Extracellular vesicles

14:00 - 14:50

#### **Extracellular vesicles & flow cytometry - two worlds collide**

*Assoc. Prof. MD Andreas Spittler, Medical University of Vienna, Core Facility Flow Cytometry & Surgical Research Laboratories*

14:50 - 15:40

#### **Regenerative therapies for broken hearts & bones**

*Univ.-Prof. Dr. med. Dirk Strunk, Paracelsus Medical University Salzburg, Institute of Experimental and Clinical Cell Therapy*

15:40 - 16:20

Coffee Break

16:20 - 17:10

#### **Enrichment, characterization & analysis of extracellular vesicles**

*Maximilian Härtinger BSc, MSc, Medical University of Vienna, Department of Plastic, Reconstructive and Aesthetic Surgery*

## **Lecture Appetizers:**

### **Extracellular vesicles & flow cytometry - two worlds collide**

*Assoc. Prof. MD Andreas Spittler, Medical University of Vienna, Core Facility Flow Cytometry & Surgical Research Laboratories*

Flow cytometry is an excellent method for detecting EVs from plasma. However, the use of different devices can lead to non-comparable and non-reproducible results. In this presentation, the pitfalls in the determination of EVs will be presented and the standardization/calibration of flow cytometers will be discussed. Calibration of flow cytometers is an essential step that now makes it possible to compare results between different instruments.

### **Regenerative therapies for broken hearts & bones**

*Univ.-Prof. Dr. med. Dirk Strunk, Paracelsus Medical University Salzburg, Institute of Experimental and Clinical Cell Therapy*

REGENERATIVE MEDICINE is a rather young discipline dedicated to treating diseases by strengthening the body's own regenerative potential. Several roadblocks including paucity of stem cells, fibrosis and/or scarring in response to injury as well as chronic inflammation often hinder endogenous regeneration. Regenerative therapies tackle such regenerative roadblocks to replace compromised tissue components.

The Cell Therapy Institute at Paracelsus Medical University Salzburg is developing cell-based platform technologies to be applied in regenerative medicine for various disease entities. Examples will be presented for using HLA-homozygous induced pluripotent stem cell-derived cardiomyocyte aggregates (iPS-CMA) to fix 'broken hearts' and for deciphering epigenomic mechanisms underlying the skeletal regeneration capacity of bone- and cartilage-forming progenitor cells. A more complex iPS-derived floating skin organoid model will be discussed demonstrating the superordinate progenitor self-organization competence that can be used to build patient-derived organoids (PDO) and patient-derived xenotransplant (PDX) models for validating novel cell-based or gene therapies. As an overarching topic we will discuss the role of nanometer-sized cell-derived extracellular vesicles (EVs) as a newly discovered trophic mode of action of cell-based therapies and the applicability of EVs as biomarkers of disease and for therapy monitoring.

### **Enrichment, characterization & analysis of extracellular vesicles**

*Maximilian Härtinger BSc, MSc, Medical University of Vienna, Department of Plastic, Reconstructive and Aesthetic Surgery*

Extracellular vesicles (EVs) are key players in intercellular communication involved in a plethora of physiological and pathophysiological processes. However, due to their small size, analysis of nanoscale EVs remains a challenge and requires advanced technology. With a growing body of knowledge around EV biology, methods and techniques also advance. We will discuss different enrichment strategies ensuring yield, purity and function. Further, we talk about advances in characterization, imaging and analysis of EVs, ensuring standardization and comparability. We will close with a quick guide how you can start incorporating EVs into your projects.