

**14<sup>TH</sup>**  
CONGRESS

# Targeting Mitochondria



Oct. 11 » 13 2023  
Berlin © Germany





# 14<sup>th</sup> World Congress on Targeting Mitochondria

October 11-13, 2023 – Berlin, Germany

## Welcome to the World Mitochondria Society Annual Meeting

On behalf of the Scientific Committee of the World Mitochondria Society (WMS), we are pleased to announce the organization of the 14th Annual Meeting of WMS on Targeting Mitochondria, which will be held on October 11-13, 2023 at the Steigenberger Hotel Am Kanzleramt, Berlin, Germany, & online. As the mitochondria continue to captivate the scientific community with their pivotal role in health and disease, this conference serves as a premier platform for cutting-edge discussions, knowledge exchange, and collaboration between esteemed researchers, healthcare professionals, and industry experts from around the world.

Mitochondria, often referred to as the "powerhouses of the cell", have long been recognized for their vital role in energy production. However, recent breakthroughs have unveiled their profound involvement in a myriad of cellular processes, including metabolism, aging, neurodegenerative diseases, cancer, and beyond. Harnessing this newfound understanding, researchers and medical professionals are now exploring innovative strategies to target mitochondria, aiming to unravel novel therapeutic interventions that hold immense promise for human health and well-being.

The Targeting Mitochondria 2023 Congress aims to provide a comprehensive overview of the latest advancements, challenges, and potential opportunities in the field of mitochondrial research. By covering diverse topics ranging from biodynamics and longevity to environmental factors and pharmaceutical innovations, the congress offers a platform for scientists, researchers, and experts to exchange knowledge and collaborate in advancing our understanding of mitochondria and its significance in various aspects of health and disease.

Among the sessions that will be covered:

- *Mitochondrial Activity in Health & Diseases: Standpoint 2023*
- *Mitochondrial Medicine: Where are the Targets?*
- *Mitochondria, Microgravity & Space Travel – A glance into the future*

The Targeting Mitochondria Congress is designed to foster a vibrant atmosphere of scientific exploration and collaboration, where experts from diverse disciplines can convene, exchange ideas, and forge valuable connections. Our distinguished lineup of speakers comprises world-renowned scientists, clinicians, and industry leaders who are at the forefront of mitochondrial research, providing unique insights and breakthrough discoveries. From fundamental aspects to clinical applications, the conference will span a wide range of topics, enabling participants to gain a comprehensive understanding of the latest advancements in the field.

Join us at the 14th World Congress on Targeting Mitochondria to unlock the mysteries of these extraordinary organelles, delve into groundbreaking research, and contribute to the collective effort of revolutionizing healthcare through mitochondrial targeting. Together, let us illuminate the path towards innovative therapeutic strategies and redefine the possibilities for human health.

We look forward to welcoming you to this remarkable event!

All our warmest regards.



**Prof. Volkmar Weissig**  
President of the World Mitochondria Society  
Midwestern University, USA



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## Targeting Mitochondria 2023 Speakers



### Welcome Note

**Volkmar Weissig**, President of the WMS,  
Midwestern University, USA



### Why a WMS Task Force

**Marvin Edeas**, Institut Cochin, Université  
de Paris, France



**Brain Organoids to Model  
Mitochondrial Neurological Diseases**  
**Alessandro Prigione**, Heinrich Heine  
University (HHU) Düsseldorf, Germany



**Vladimir Skulachev's Strategic Impact  
on Mitochondrial Medicine: A Tribute  
to his Vision, Discoveries, and Legacy**  
**Vladimir Gogvadze**, Karolinska  
Institutet, Sweden



**Mitochondrial Stress as a Central  
Biological Hub for Spaceflight Impact**  
**Afshin Beheshti**,  
Blue Marble Space Institute of Science,  
USA



**Cholesterol: Why Have Mitochondrial  
Biologists Ignored this Critical  
Mitochondrial Component for Over a  
Century?**  
**Ian Holt**, Instituto de Investigación  
Sanitaria Biodonostia, Spain



**What spaceflight and bed rest have in  
common: A proteomic point of view**  
**Marta Murgia**, University of Padova, Italy



**Mitochondrial Transplantation:  
What's Next?**  
**James McCully**,  
Boston Children's Hospital, USA



**Mitochondria                      Organelle  
Transplantation for                      Neurological  
Diseases and Aging**  
**Mark S. Kindy**, University of South  
Florida, USA



**Protein                      Transport                      across  
Mitochondrial Membranes**  
**Peter Rehling**, University Medical Center  
Göttingen, Germany



**Restoration of Mitochondrial  
Homeostasis provides Glaucoma  
Neuroprotection**  
**Arupratan Das**, Indiana University  
School of Medicine, USA



**Targeting Mitochondrial Activity in  
Liver Disease: Barriers and  
Perspectives**  
**María Luz Martínez-Chantar**, CIC  
bioGUNE, Spain



**Internalization of Exogenous  
Mitochondria for Endothelial Corneal  
Dystrophy Treatment**  
**Patrick J. Rochette**,  
Université Laval, Canada



**Liver Regeneration: Strategic Role of  
Mitochondria**  
**Jiri Neuzil**, Griffith University, Australia



**Targeting Mitochondria Based on  
Mitochondrial Drug Delivery Systems**  
**Yuma Yamada**,  
Hokkaido University, Japan



**Targeting MCJ/DnaJC15 to modulate  
mitochondrial respiration in disease**  
**Mercedes Rincon**, University of Colorado  
Anschutz School of Medicine, USA



**Mitochondrial Presequence Protein  
Translocation**  
**Nils Wiedemann**, Universität Freiburg,  
Germany



**Repairing Marginal Kidneys With  
Mitochondrial Transplantation: A New  
Powerful Tissue Engineering Tool That Will  
Change the Transplant Landscape**  
**Giuseppe Orlando**, Wake Forest University,  
USA



**Metabolic effects of *Cimicifuga racemosa*  
extract on mitochondria and  
implications for the resistance against  
oxidative cell death and longevity**  
**Carsten Culmsee**, University of Marburg,  
Germany



**Cardiac MitoMed: From Bench to  
Bedside**  
**Sang-Bing Ong**, The Chinese University  
of Hong Kong, China



**MNRR1/CHCHD2 and Mitochondrial  
Dysfunction in Disease**  
**Lawrence Grossman**,  
Wayne State University, USA



**Defining the molecular nature of the  
mitochondrial                      permeability  
transition pore(s)**  
**Paolo Bernardi**, the University of  
Padova, Italy



**The Power of Epigenetics: the Patterns  
of mitoDNA Methylation Transmitted  
Across Generation**  
**Marc-André Sirard**, Université Laval,  
Canada



**Personalized                      Medicine                      in  
Mitochondrial Health and Disease:  
Myth and Reality**  
**Ciro Leonardo Perri**, the University of  
Bari Aldo Moro, Italy



**Mitochondrial                      Monitoring                      in  
Perioperative and Critical Care:  
Recent Advances & Perspectives**  
**Egbert Mik**, Erasmus MC, The  
Netherlands



**WASF3 disrupts mitochondrial  
respiration and may mediate exercise  
intolerance in ME/CFS**  
**Paul Hwang**, National Heart, Lung and  
Blood Institute, USA

[www.wms-site.com](http://www.wms-site.com)



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Wednesday, October 11, 2023

Dedicated to Mitochondria Workshop

13h30 – Registration for Workshop and Targeting Mitochondria 2023 Congress

## Mitochondria Workshop 2023: How to Evaluate Mitochondria Function?

**Session 2:** Methods for analyzing mitochondrial function: Bioenergetics

*15h30 Coffee Break*

**Session 3:** Methods for analyzing mitochondria: Biogenesis, dynamics, and mitophagy

**Session 4:** Biochemical strategies for the diagnosis of mitochondrial disorders

Presentation of Practical Cases, Workshop report & Interactive Discussion

18h30 End of the Workshop



**Naïg Gueguen**

Mitovasc Institute, Mitolab team,  
INSERM 1083, CNRS 6215,  
Centre Hospitalier Universitaire d'Angers  
Angers, France

For full agenda, registration, and information, please follow this link

**MITOCHONDRIA  
WORKSHOP**



# 14<sup>th</sup> World Congress on Targeting Mitochondria

October 11-13, 2023 – Berlin, Germany

– Day One –

Thursday, October 12, 2023

8h00 – Materials Distribution & Welcome Coffee

8h50 – Welcome Note



**World Mitochondria Society Now & Tomorrow**

**Volkmar Weissig**, President of the World Mitochondria Society, Midwestern University, USA



**Marvin Edeas**, WMS Founder & Chairman of The Scientific Committee, Université de Paris, INSERM 1016, Institute Cochin, France



9h00 – **Vladimir Skulachev's Strategic Impact on Mitochondrial Medicine: A Tribute to his Vision, Discoveries, and Legacy**

Vladimir Gogvadze, Karolinska Institutet, Sweden



9h25 – **The Vladimir Skulachev Vision: Advances in the Development of Mitochondria-Targeted Pharmaceuticals**

Maxim Skulachev, Mitotech, Luxembourg

## Session 1 – Mitochondrial Activity in Health & Diseases: Standpoint 2023

Talk Duration : 15 minutes for presentation + 5 minutes for discussion



9h35 – **Cholesterol: Why Have Mitochondrial Biologists Ignored this Critical Mitochondrial Component for Over a Century?**

Ian Holt, Instituto de Investigación Sanitaria Biodonostia, Spain



9h55 – **Brain Organoids to Model Mitochondrial Neurological Diseases**

Alessandro Prigione, Heinrich Heine University Düsseldorf, Germany



10h15 – **The Power of Epigenetics: The Patterns of mitoDNA Methylation Transmitted Across Generations**

Marc-André Sirard, Université Laval, Canada

10h35 - Coffee Break, Networking & Poster Session



11h15 – **WASF3 disrupts mitochondrial respiration and may mediate exercise intolerance in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)**

Paul Hwang, National Heart, Lung and Blood Institute, USA





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**11h35 – Defining the Molecular Nature of the Mitochondrial Permeability Transition Pore(s)**  
*Paolo Bernardi, University of Padova, Italy*



**11h55 – Protein Transport across Mitochondrial Membranes**  
*Peter Rehling, University Medical Center Göttingen, Germany*



**12h15 – Mitochondrial Presequence Protein Translocation**  
*Nils Wiedemann, Universität Freiburg, Germany*

*12h35 – Lunch Break, Networking & Poster Session*



**14h00 – Mitochondrial Monitoring in Perioperative and Critical Care: Recent Advances & Perspectives**  
*Egbert Mik, University Medical Center Rotterdam, The Netherlands*

## 14h20 Short Oral Presentations

*Talk Duration : 5 minutes for presentation + 2 minutes for discussion*

### **Interferometry Light Microscopy for Quality Control of Isolated Mitochondria for Biotherapy**

*Sabah Mozafari, Université Paris Cité, France*

### **Intercellular Mitochondrial Transfer: Real-Time Monitoring and Lineage Cell Tracing with Novel Reporter Systems Unveil Roles in Cancer Innervation**

*Simon Grelet, University of South Alabama, USA*

### **High Sucrose Diet Triggers Subunit I Tyrosine 304 Phosphorylation of Cytochrome C Oxidase, Causing Liver Respiratory Dysfunction in the Cohen Diabetic Rat Model**

*Tasnim Arroum, Wayne State University, USA*

## Session 2 – Mitochondrial Medicine: Where are the Targets?

*Talk Duration : 15 minutes for presentation + 5 minutes for discussion*



**14h45 – Introduction - Mitochondrial Transplantation: What's Next?**  
*James McCully, Harvard Medical School Department of Cardiac Surgery Boston Children's Hospital, USA*



**15h05 – Repairing Marginal Kidneys With Mitochondrial Transplantation: A New Powerful Tissue Engineering Tool That Will Change the Transplant Landscape**  
*Giuseppe Orlando, Wake Forest University, USA*



**15h25 – Mitochondria Organelle Transplantation for Neurological Diseases and Aging**  
*Mark S. Kindy, University of South Florida, USA*

*15h45 – Coffee Break, Networking & Poster Session*



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## 16h15 – Targeting Mitochondria Based on Mitochondrial Drug Delivery Systems (DDS)

Yuma Yamada, Hokkaido University, Japan



## 16h35 – Metabolic effects of *Cimicifuga racemosa* extract on mitochondria and implications for the resistance against oxidative cell death and longevity

Carsten Culmsee, University of Marburg, Germany



## 16h55 – Translational insights from Targeting Mitochondria in Rare Diseases

David Brown, Stealth BioTherapeutics, USA

### 17h05 Short Oral Presentations

Talk Duration : 5 minutes for presentation + 2 minutes for discussion

#### Mitochondrial Dysfunctions in Psoriatic Mesenchymal Stem Cells

Mariangela Di Vincenzo, Università Politecnica delle Marche, Italy

#### Cardiomyocyte MTFP1 Loss Induces Heart Failure Fostered by Innate Immunity

Erminia Donnarumma, Institute Pasteur, France

#### Mitochondrial Cargo in Extracellular Vesicles Promotes Microglia-Mediated Proinflammatory Response

Carla Lopes, University of Coimbra, Portugal

#### Granulosa Cell Mitochondrial AKT Signaling Regulated Ovarian Folliculogenesis and Whole-Body Metabolism

Ping H Wang, City of Hope National Medical Center, USA

#### The Influence of Maternal Obesity on Offspring Oocyte Mitochondrial Ultrastructure in Primordial and Activated Follicles. Interaction with the Offspring Diet

Inne Xhonneux, University of Antwerp, Belgium

#### Restoration of Mitochondrial Homeostasis in Embryos Derived from Metabolically Compromised Oocytes Using Mitoquinone. Insight from a Bovine *in vitro* Model

Waleed Marei, University of Antwerp, Belgium

#### Mismatch of Mitochondrial and Nuclear Genomes Leads to Altered Fitness

Marion Bonneau, University College London, United Kingdom

#### Estrogen Metabolism and Mitochondrial Function in the Pathogenesis of Idiopathic Pulmonary Arterial Hypertension

Valentina Parra, Universidad de Chile, Chile

### 18h00 End of Day 1

### 20h00 Meet the Speakers Dinner (for ticket holders only)



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– Day Two –

Friday, October 13, 2023

8h00 – Welcoming of attendees

8h25 – Day 2 opening session

## Session 2 – Mitochondrial Medicine: Where are the Targets? (Continued)

Talk Duration : 15 minutes for presentation + 5 minutes for discussion



**8h30 – Restoration of Mitochondrial Homeostasis Provides Glaucoma Neuroprotection**

*Arupratan Das, Indiana University School of Medicine, USA*



**8h50 – Cardiac MitoMed: From Bench to Bedside**

*Sang-Bing Ong, The Chinese University of Hong Kong, China*



**9h10 – Personalized Medicine in Mitochondrial Health and Disease: Myth and Reality**

*Ciro Leonardo Pierri, University of Bari Aldo Moro, Italy*



**9h30 – Internalization of Exogenous Mitochondria for Endothelial Corneal Dystrophy Treatment**

*Patrick J. Rochette, Université Laval, Canada*

### 9h50 Short Oral Presentations

**Age-related changes in energy metabolism in peripheral mononuclear blood cells (PBMC) and the brains of cognitively healthy seniors**

*Gunter P. Eckert, Justus-Liebig-University of Giessen, Germany*

**MITO-DREADD: A New Tool to Increase Mitochondrial Activity and Rescue Cognitive Alteration**

*Etienne Hebert-Chatelain, University of Moncton, Canada*

**Incorporation of Exogenous Mitochondria Amplifies ATP Production and Safeguards Fibroblasts against Oxidative Stress**

*Yosif El-Darawish, LUCA Science Inc., Japan*

**Development of Mitochondria-Inspired Lipopolyplexes for Gene Delivery**

*Ioannis Tsielhis, National and Kapodistrian University of Athens, Greece*

**Mitochondrial Encapsulation Technology for Mitochondrial Transplantation Therapy**

*Wang Yonghui, Åbo Akademi University, Finland*

*10h25 - Coffee Break, Networking & Poster Session*





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## 11h00 – Liver Regeneration: Strategic Role of Mitochondria

Jiri Neuzil, Griffith University, Australia



## 11h20 – MNRR1/CHCHD2 and Mitochondrial Dysfunction in Disease

Lawrence Grossman, Wayne State University, USA



## 11h40 – Targeting Mitochondrial Activity in Liver Disease: Barriers and Perspectives

María Luz Martínez-Chantar, CIC bioGUNE, Spain



## 12h00 – Targeting MCJ/DnaJC15 to Modulate Mitochondrial Respiration in Disease

Mercedes Rincon, University of Colorado Anschutz School of Medicine, USA

### 12h20 Short Oral Presentations

#### Enhanced Activity of Mitochondrial Enzyme Fumarylacetoacetate Domain Containing Protein 1 (FAHD1) Reduces Cellular ROS Levels in Human Bone Osteosarcoma Epithelial Cells

Alexander K.H. Weiss, University of Innsbruck, Austria

#### Biological Activity and Antioxidant Capacity of Novel Mitochondria-Targeted Estrogens

Geovanni Alberto Ruiz Romero, Centro De Investigación Científica Y De Educación Superior De Ensenada, Mexico

12h35 – Lunch Break, Networking & Poster Session

## Session 3 – Mitochondria, Microgravity & Space Travel: A glance into the future

Talk Duration : 15 minutes for presentation + 5 minutes for discussion



## 14h00 – Mitochondrial Stress as a Central Biological Hub for Spaceflight Impact

Afshin Beheshti, NASA Ames Research Center, USA



## 14h20 – What Spaceflight and Bed Rest Have in Common: A Proteomic Point of View

Marta Murgia, University of Padova, Italy

### 14h40 Short Oral Presentations

#### Gravitational and Mechanical Forces Drive Mitochondrial Translation

Taisei Wakigawa, University of Tokyo, Japan



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## **Examination of Mitochondrial DNA Variants and their Association with Brain Structural Measures and Symptom Severity in Bipolar Disorder**

*Ana Mendes-Silva, Campbell Family Mental Health Research Institute, Canada*

## **Mitochondria and ROS Signaling as Key Players in Arrhythmogenic Cardiomyopathy? A Molecular Screening-Based Answer**

*Réginald Philippe, Eurac Research, Italy*

## **The mitochondrial Ca<sup>2+</sup> Uniporter (MCU) is a molecular target for mobility by stimulating muscle performance and protecting chondrocytes during osteoarthritis**

*Umberto De Marchi, Nestlé Institute of Health Sciences, Nestlé Research, Switzerland*

## **Mitochondrial Pyruvate Metabolism is Disturbed in Polymicrobial Sepsis**

*Louise Nuytens, Ghent University – Inflammation Research Center, Belgium*

## **Mitochondrial DNA Variants and Microbiota: An Experimental Strategy to Identify Novel Therapeutic Targets in Chronic Inflammatory Diseases**

*Mira Hirose, University of Lübeck, Germany*

*15h25 - Coffee Break & Poster Session*

## **15h55 Session 4 – Short Oral Presentations**

*Talk Duration : 5 minutes for presentation + 2 minutes for discussion*

## **Exploiting Structural Variations in Highly Conserved Mitochondrial Complex III to Develop Antifungal Agents**

*Di Xia, National Cancer Institute, NIH, USA*

## **Opening up the World to Mitochondrial Issues**

*Gordon Freedman, National Laboratory for Education Transformation, USA*

## **Platelet-Derived Mitochondria Modulate the Bioenergetic Phenotype of Human Neutrophils**

*Marie-France N. Soucy, Université de Moncton, Canada*

## **Mitochondrial Gene Expression is Required for Platelet Function and Blood Clotting**

*Jessica Baker, The University of Western Australia, Australia*

## **NME3 is a Gatekeeper of DRP-1-Dependent Mitophagy**

*Zee-Fen Chang, National Taiwan University, Taiwan*

## **Cryo-EM Studies Reveal the Inactivation Mechanism of ATP Synthase Leak Channel and Its Contribution to Mitochondrial Permeability Transition**

*Nelli Mnatsakanyan, Penn State University College of Medicine, USA*

## **ATFS-1 Counteracts Mitochondrial DNA Damage by Promoting Repair Over Transcription**

*Chuanyang Dai, University of Queensland, Australia*

## **TPP-driven Mitochondria-targeting Compounds as Agrochemicals**

*Zhaohai Qin, China Agricultural University, China*



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## **Adjuvant Therapy with Molecular Hydrogen Improved Platelet Mitochondrial Bioenergetics and Coenzyme Q<sub>10</sub> Level in Patients with Non-Alcoholic Fatty Liver Disease**

*Zuzana Sumbalová, Comenius University in Bratislava, Slovakia*

## **Effect of Time-Restricted Feeding on Mitochondria in Skeletal Muscle of Aged Mice**

*Andrea Del Campo, Pontificia Universidad Catolica De Chile, Chile*

## **Mitochondrial Involvement in Cardiac Electrophysiological Injury Due to Inhalation Exposure to Electronic Nicotine Delivery Systems (ENDS)**

*Sami Noujaim, University of South Florida, USA*

## **Mitochondrial Transplantation Therapy Against Ifosfamide Induced Toxicity on Rat Renal Proximal Tubular Cells (Online talk)**

*Melika Mashhadi, Shahid Beheshti University of Medical Sciences, Iran*

## **17h20 Why a Mitochondria Task Force?**

### **Concluding remarks & Targeting Mitochondria 2023 Awards**

## **18h00 End of World Mitochondria Society's Annual Meeting**



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For more information, please visit: [www.wms-site.com](http://www.wms-site.com) or contact us at [mitochondria\[at\]wms-site.com](mailto:mitochondria[at]wms-site.com).