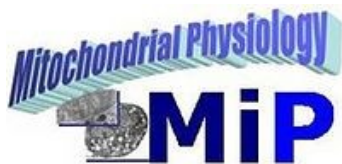


12th Conference on Mitochondrial Physiology

The role of mitochondria in lifestyle and metabolic syndrome -
COST MitoEAGLE perspectives



MIP2017 Programme



TUESDAY, Nov 14

Conference venue: **Charles University, Faculty of Medicine in Hradec Králové,
Šimkova 870, Hradec Králové, Czech Republic**

17:00 – 19:00 **Registration**

19:00 **Welcome reception**

WEDNESDAY, Nov 15

08:00 – 16:00 **Registration**

09:00 – 09:15 **Opening and welcome address by the conference organizers**

Topic A: Metabolic syndrome

Session A1 *Symptoms, etiopathogenesis, and mitochondrial function*

CHAIRS: Červinková Zuzana, Hoppel Charles L

09:15 – 9:45 **Lee Hong Kyu** *invited speaker*

Functional difference of mitochondrial genome and its association with phenotypes of metabolic syndrome

09:45 - 10:15 **Periasamy Muthu** *invited speaker*

Targeting skeletal muscle energetics to control obesity and diabetes

10:15 - 10:30 **Kučera Otto**

Commonly used models of non-alcoholic fatty liver disease (NAFLD)

10:30 - 10:45 **Petit Patrice**

Barth syndrome: cardiolipin alterations linked to tafazzin mutations leads to apoptosis and mitophagy inhibition

10:45 - 11:00 **Kovalčíková Jana**

Mitochondrial protein TMEM70: key role in the biogenesis of ATP synthase verified in a mouse knockout model

11:00 - 11:30 *Coffee break*

Research and education in mitochondrial physiology

CHAIRS: Lemieux H el ene, Drahota Zdenek

 11:30 - 12:00 **Hoppel Charles** *invited speaker*
 Pathways of mitochondrial fatty acid oxidation

Session A2 Alterations of mitochondrial respiration in metabolic syndrome

CHAIRS:  sander Frostner Eleonor, Boyle John

 12:00 - 12:15 **Lemieux H el ene**
 Compounding effects of age and sexual dimorphism on cardiac mitochondrial function in type 2 diabetes

 12:15 - 12:30 **Boyle John**
 Type 2 diabetes causes systemic skeletal muscle Complex I mitochondrial dysfunction in chronic heart failure patients

 12:30 - 12:45 **Nemec Michal**
 Three-month exercise modulates functional state of muscle mitochondria in patients with mild cognitive impairment

 12:45 – 13:45 *Lunch*

 13:45-14:45 **Poster session 1**

1. **Metabolic syndrome differentially impacts the retina and underlying retinal pigment epithelium cells.**
 Han Ted, Sauve Y, Lemieux H.
2. **Mitochondrial function of peripheral blood mononuclear cells (PBMCs) in subjects with metabolic syndrome.**
 Keppner Gloria-Maria, Rennekamp R, Hauner, Skurk T, Klingenspor M.
3. **Different molecular composition of *Lysimachia* species result in distinct metabolism.**
 Toth A, Lener V, Riethmuller E, Kery A, [Kolonics A.](#)
4. **Porcine sepsis and associated myocardial depression.**
 Markova Michaela, Jarkovska D, Horak J, Nalos L, Benes J, AL-Obeidallah M, Sviglerova J, Kuncova J, Matejovic M, Stengl M.
5. **Novel method to study the role of adenylate kinase network in health and disease.**
 Klepinin Aleksandr, Ounpuu L, Guzun R, Chekulayev V, Timohhina N, Tepp K, Shevchuk I, Schlattner U, Kaambre T.
6. **Impairment of platelet mitochondrial respiration in metabolic syndrome: A pilot study.**
 Muntean Danina M, Petruş A, Raţiu C, Ionică M, Duicu O, Lighezan R
7. **The early adaptation of rat liver mitochondria to high fat diet.**
 Noţičková Kateřina, Kučera O, Sobotka O, Staňková P, Endlicher R, Banni A, Červinková Z

8. **Age-related changes in isolated mitochondria from rat liver**
Endlicher René, Drahotka Z, Staňková P, Kučera O, Červinková Z
9. **Dietary and pharmacological anti-obesogenic treatments improve myocardial metabolism in diet-induced obese mice**
Jansen Kirsten
10. **Mitochondrial membrane permeability transition pore: function and regulation**
Zdeněk Drahotka

Special lecture: Honorary member of the MiP society

CHAIRS: Calabria Elisa, Watala Cezary

14:45-15:00 **Červinková Zuzana**
RNDr. Zdenek Drahotka, D.Sc. - jubilant

Session A3 Tissue-specific mitochondrial manifestations of metabolic syndrome

CHAIRS: Tepp Kersti, Meszaros Andras

15:00 - 15:30 **Garcia-Roves Pablo Miguel** *invited speaker*

Assessing metabolic plasticity in diet-induced obese mice upon lifestyle intervention: an integrative approach.

15:30 - 15:45 **Makrecka-Kuka Marina**

Heart, brain and kidneys: who will survive? Tissue-specific changes in mitochondrial function in the experimental model of endotoxemia

15:45 - 16:00 **Shabalina Irina**

In UCP1-ablated mice, prolonged cold exposure promotes mitochondrial dysfunction, apoptosis and inflammation in brown adipose tissue, and accumulation of visceral obesogenic fat

16:00 - 16:15 **Sobotka Ondřej**

Metabolic changes in rat liver mitochondria during the development of liver steatosis

16:15 - 16:30 **Labieniec-Watala Magdalena**

Lack of the effect of low metformin concentrations on the response of breast cancer cell mitochondria to radiotherapy under conditions of *in vitro* experimental hyperglycemia

16:30 - 17:00 *Coffee break*

Research and education in mitochondrial physiology

CHAIRS: Veliká Beáta, Palmeira Carlos

17:00 – 17:30 **Gnaiger Erich**

Protonmotive force and chemiosmotic pressure: a generalization of non-ohmic flux control of the proton leak

General topics

CHAIRS: Marina Makrecka-Kuka, Nemeč Michal

17:30 - 18:30 **Oral presentations: Selected abstracts and poster flashes**

17:30 – 17:40 **Suravajhala Prashanth**

Can dynamic simulations explain the time course in stressed mitochondrial conditions?

19:30 – 22:00 **Social program: Dinner in traditional Czech restaurant Na Hradě**



THURSDAY, Nov 16

Topic B: Lifestyle

Session B1 Mitochondrial function in exercise and lifestyle

CHAIRS: Muntean Danina M, Ben-Shachar Dori

09:00–09:30 **Coen Paul** *invited speaker*

Impact of calorie restriction and exercise on mitochondrial metabolism in obesity

09:30 – 10:00 **Irving Brian** *invited speaker*

Impact of acute exercise on PBMC respiratory function and methodological considerations

10:00 – 10:15 **Løvsletten Nils**

Increased glucose and fatty acid metabolism and metabolic flexibility in myotubes from trained subjects

10:15 – 10:30 **Renner Kathrin –Sattler**

D-2-hydroxyglutarate interferes with HIF-1 α stability skewing T-cell metabolism towards oxidative phosphorylation and impairing Th17 polarization

10:30 – 10:45 **Sumbalová Zuzana**

The effect of lifestyle on respiration of peripheral blood mononuclear cells and platelets

10:45 – 11:15 *Coffee break*

Session B2 Mitochondrial metabolism in health and disease

CHAIRS: Renner-Sattler Kathrin, Coen Paul M

11:15 – 11:45 **Liu Jiankang** *invited speaker*

Targeting mitochondria for preventing and treating diabetes with natural compounds from food and nutrition

11:45 - 12:15 **Palmeira Carlos** *invited speaker*

Metabolic diseases and mitochondrial remodeling

12:15 – 12:30 **Villena Josep**

PGC-1 co-activators mediate calorie restriction-induced mitochondrial biogenesis in white adipose tissue: implications on glucose homeostasis

12:30 – 12:45 **Alán Lukáš**

Role of MLQ protein in the structure and function of mammalian F₁F₀ ATP-synthase

12:45 – 13:00 **Efimova Iuliia**

Purification and subunit composition analysis in models of mammalian ATP synthase deficiencies

13:00 – 14:00 *Lunch*

14:00 – 15:00 **Poster session 2**

1. **Cellular phosphotransfer networks as a target of bioenergetic research – methods of oxygraphic study.**
Puurand Marju, Tepp K, Klepinin A, Kaambre T.
2. **Pleiotropic effects of biguanides on mitochondrial reactive oxygen species production.**
Brazdova Andrea, Pecinova A, Drahota Z, Kovalcikova J, Kovarova N, Pecina P, Alan L, Zima M, Houstek J, Mracek T.
3. **The role of dietary fibers in the energy metabolism of human colon cancer cells.**
Ounpuu Ljudmila, Klepinin A, Kaambre T.

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4. **COX4-1/COX4-2 cell knock-out/knock-in models for study of cytochrome c oxidase regulation.**
Pajuelo Reguera David, Čunátová
 5. **Mitochondrial ATP synthase disorders investigated by quantitative proteomics of CRISPR-Cas9 knockout cell lines.**
Vrbacký Marek, Kovalčíková J, Pecina Petr, Harant K, Pecinová A, Houštěk J, Mráček T.
 6. **Targeting tumor cell proliferation by inhibition of mitochondrial metabolic pathways.**
Pecinová Alena, Brázdová A, Kovalčíková J, Drahota Z, Zima M, Alán L, Pecina P, Houštěk J, and Mráček T.
 7. **Bioenergetic comparison of human colorectal and breast cancer clinical patients.**
Truu L, Koit A, Chekulayev V, Tepp K, Puurand M, Ounpuu L, Klepinin A, Shevchuk I, Kaambre T.
 8. **Role of Zn²⁺-transporters on mitochondrial function in cardiomyocytes under pathological condition.**
Aysegul Durak, Yusuf Olgar, Ceylan Verda Bitirim, Erkan Tuncay, Belma Turan
 9. **Leptin role in Sertoli cells mitochondria – a novel mechanism with possible implications in the male reproductive potential of obese individuals.**
Moreira Bruno P, Martins AD, Monteiro MP, Sousa M, Oliveira PF, Alves MG.
 10. **Epigenetic modifications regulate the metabolic alterations in cells during G1 phase of cell cycle and promote cancer cell progression: An System Biology approach.**
Sugunakar Vuree, Prashanth Suravajhala, Rajender Rao K, M Raghunath, Sudha Sinha, Raghunadharao Digumarthi, Satti Vishnupriya, and V Lakshmipathi.
 11. **Impaired mitochondrial function seems contributing to aging-associated abnormal heart function via increased production of reactive oxygen species.**
Olgar Yusuf, Durak A, Degirmenci S, tuncay E, Turan B.

Special lecture sponsored by HPST

CHAIRS: Komlódi Tímea, Slawomir Michalak

15:00 – 15:30 **Jakub Rohlena**

Reactivation of dihydroorotate dehydrogenase by respiration restores tumor growth of mtDNA-depleted cancer cells

Topic C: MitoEAGLE Working Group Meeting: selected topics

Session C Mitochondrial fitness mapping

CHAIRS: Shabalina Irina G, Karabatsiakos Alexander

- 15:30 – 15:40 **Crisóstomo Luís**
Glycerol metabolism and mitochondrial function in human Sertoli cells - a preliminary study
- 15:40 – 15:50 **Doerrier Carolina**
Effects of warm ischemia on cardiac mitochondria to detect specific targets by High-Resolution FluoRespirometry (HRFR)
- 15:50 – 16:00 **Veliká Beáta**
The cryopreserved peripheral blood mononuclear cells as a model in functional mitochondrial diagnosis
- 16:00 – 16:10 **Garcia-Souza Luiz F**
Short-term adaptation to high altitude does not affect respiration of peripheral blood mononuclear cells and platelets
- 16:10 – 16:20 **Karabatsiakís A**
The involvement of mitochondria in chronic low-grade inflammation associated with maltreatment experiences in childhood
- 16:20 - 16:30 **Siewiera Karolina**
Changes in blood platelet and brain mitochondrial respiration during short and long-lasting STZ-induced diabetes
- 16:30 – 16:40 **Komlódi Tímea**
H₂O₂ production in brain and heart mitochondria: does O₂ concentration matter?
- 16:40 – 16:50 **Mészáros András**
Mitochondrial oxygen kinetics as a sensitive diagnostic tool to determine apparent cytochrome c oxidase excess capacity
- 16:50 – 17:00 **Čunátová Kristýna**
COX4-1/4-2 knock-out causes total cytochrome c oxidase deficiency and partial impairment of mitochondrial proteosynthesis

17:00 – 17:30 *Coffee break*

General topics

17:30 – 18:30 **Oral presentations of selected abstracts and poster awards**

- 17:30 – 17:40 **Iyer Shilpa**
Bioenergetic profiling of patient derived human fibroblasts for mitochondrial diseases
- 17:40 - 17:50 **Elisa Calabria**

Age and frailty related changes in PBMCs mitochondrial function and whole body physiology

19:30 – 23:30 **Social program: Theatre performance and Gala dinner in the Drak Theatre**



FRIDAY, Nov 17

MitoEAGLE Working Group Meetings

09:00 – 10:30 **WG1: SOPs and user requirement document:
Protocols – Terminology – Reporting**

CHAIRS: Renner-Sattler Kathrin, Mészáros András

1. **MitoEAGLE preprint 2017-11-01(14). The protonmotive force and respiratory control: Building blocks of mitochondrial physiology Part 1. -**
http://www.mitoeagle.org/index.php/MitoEAGLE_preprint_2017-09-21

10:30 – 11:00 *Coffee break*

11:00 – 12:30 **WG2: MitoEAGLE data repository on muscle tissues**

CHAIRS: Votion Dominique, Garcia-Roves Pablo Miguel

1. **Coen Paul M, Distefano G, Doerrier C, Pesta D, Larsen S, Garcia-Roves PM**
Human skeletal muscle mitochondrial function: A proposal for a state-of-the-art literature review
2. **Doerrier Carolina, Distefano G, Coen P, Goodpaster B, Gnaiger E**
Upper limit of OXPHOS capacity in permeabilized myofibers: effect of oxygen, ADP and blebbistatin in MiR05Cr and Buffer Z
3. **Rustan Arild C.**
How far are cultured human myotubes from home?

4. **Garcia-Roves Pablo M, Chabi B, Cortade F, Doerrier C, Dubouchaud H, Gama-Perez P, Grefte S, Irving B, Moreno S, Ost M, Pesta D**
Mitochondrial respirometry reference values from permeabilized mouse soleus muscle fibers. MitoEAGLE WG2 pilot study
5. **Larsen Terje**
Repository for storage of cardiac muscle respirometry data in MitoEAGLE format.
6. **Steen Larsen**
The effect on respiratory capacity using different respiration buffers
7. **Poster: Kinetics of inhibition of energy metabolism pathways by propofol in human skeletal muscle homogenates.**
Urban Tomáš, Krajčová A, Kunčický P, Bukovský J, Waldauf P, Džupa V, Drahotka Z, and Duška F.

12:30 – 14:00 Lunch

14:00 – 15:30 **WG3: MitoEAGLE data repository on fat, neuronal and liver tissues**

CHAIRS: Staňková Pavla, Nedergaard Jan

1. **Bergman Oded, Karry Rachel, Ben-Shachar Dori**
Impaired homeostasis of mitochondrial complex I in schizophrenia: a possible link to NDUFV2 pseudogene
2. **Nedergaard Jan, Shabalina IG, Cannon B**
Creatine effect in mitochondria from different tissues
3. **Staňková Pavla, Endlicher R, Kučera O, Červinková Z**
Isolation of rat liver mitochondria for bioenergetic studies
4. **Muntané Jordi, González R, Rangelova K, Cuadrado A, Padillo FJ, Rodríguez-Hernández MA**
The endoplasmic reticulum stress is the driving signaling promoting cell death in a context of reduced oxidative/nitrosative stress during treatment of liver cancer cells with Sorafenib
5. **Poster: Pecina P, Nůsková H, Kovalčíková J, Zídek V, Landa V, Kaplanová V, Kolář F, Papoušek F, Sedmera D, Kazdová L, Bardová K, Flachs P, Tauchmannová K, Drahotka Z, Kopecký J, Pravenec M, Houštěk J and Mráček T**
Knockout of DAPIT, an accessory subunit of mitochondrial ATP synthase, causes right ventricular hypertrophy and pulmonary hypertension

15:30 – 16:00 Coffee break

16:00 – 17:30 **WG4: MitoEAGLE data repository for blood cells and cultured cells**

CHAIRS: Moiso Nicoleta, Crisostomo Luis

1. **Michalak Slawomir, Rybacka–Mossakowska J, Osztynowicz K, Biernacka – Lukanty J , Tokarz – Kupczyk E, Kozubski W**
The effect of anticoagulants on mitochondrial respiration in intact peripheral blood mononuclear cells
2. **Calabria Elisa, de Jong V, Tarperi C, Schena F**
PBMCS purification and mitochondrial function assay: monitoring preparative steps and comparison of protocols
3. **Temelie Mihaela, Diana Iulia Savu, Nicoleta Moiso**
Mitochondria-nucleus communication. Linking Parkinson’s related mitochondrial dysfunction with DNA damage signaling
4. **Pieroni Luisa, Alberio T, Ronci M, Roncada P, Urbani A, Fasano M, the Italian mt-HPP Consortium**
Toward the standardization of mitochondrial proteomics: the Italian mitochondrial Human Proteome Project Initiative
5. **Sumbalová Z, Garcia-Souza LF, Veliká B, Menz V, Gatterer H, Burtscher M, Gnaiger E**
Purity of blood cells fractions in respirometric studies: peripheral blood mononuclear cells and platelets.
6. **Poster: A new cell culture models of urothelial carcinoma links mitochondrial physiology to multidrug resistance.**
Kripnerová M, Marková M, Hatina J, Kuncová J.
7. **Poster: Mitochondrial respiration in intact peripheral blood mononuclear cells in multiple sclerosis patients.**
Rybacka–Mossakowska J, Slawomir Michalak, Osztynowicz K, Biernacka–Lukanty J, Tokarz–Kupczyk E, Kozubski W.
8. **Poster: Cell-permeable succinate and malonate as research tools**
Åsander Frostner Eleonor, Ehinger JK, Piel S, Karlsson M, Chamkha I, Sjövall F, Moss SJ, Webster LR, Hansson MJ, Elmér E

SATURDAY, Nov 18

MitoEAGLE Management Committee Meeting

09:00 – 10:30 **Management Committee Meeting**

1. Welcome to participants
2. Verification of the presence of two-thirds of the Participating COST Countries or, if applicable, a quorum
3. Adoption of agenda
4. Approval of minutes and matters arising of last meeting
5. Update from the Action Chair
 - a) Status of Action: start and end dates of Action, participating COST countries, participating NNC/ IPC institutions and Specific Organisations.
 - b) Short Term Scientific Missions (STSM): review of completed reports and new applications
6. Update from the Grant Holder: Action budget status
7. Update from the COST Association

10:30 – 11:00 Coffee break

11:00 – 12:30 Management Committee Meeting

8. Monitoring of the Action
9. Implementation of COST policies on:
 - a) Promotion of gender balance and Early Career Investigators (ECI)
 - b) Inclusiveness and Excellence
10. Follow-up of MoU objectives: progress report of working groups
11. Scientific planning
 - a) Scientific strategy (MoU objectives, GP Goals, WG tasks and deliverables)
 - b) Action Budget Planning
 - c) Long-term planning (including anticipated locations and dates of future activities)
 - d) Dissemination planning (Publications and outreach activities)
12. Requests to join the Action from:
 - a) COST countries
 - b) Institutions in Near Neighbouring Countries, International Partner Countries, and/or Specific Organisations: EU agencies, European RTD Organisation, International Organisations
13. AOB
14. Location and date of next meeting
15. Summary of MC decisions
16. Closing

12:30 - 13:00 Conclusion

13:00 – 14:00 Lunch