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, Šímkova 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 Hélène, 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: Åsander Frostner Eleonor, Boyle John

12:00 - 12:15  **Lemieux Hélène**
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.**
5. **Novel method to study the role of adenylate kinase network in health and disease.**
6. **Impairment of platelet mitochondrial respiration in metabolic syndrome: A pilot study.**
7. **The early adaptation of rat liver mitochondria to high fat diet.**
8. **Age-related changes in isolated mitochondria from rat liver**
   Endlicher René, Drahota 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 Drahota

**Special lecture:** Honorary member of the MiPsociety

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

**Session A3**  *Tissue-specific mitochondrial manifestations of metabolic syndrome*

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, Nemec 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-1α 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 F_{1}F_{0} 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.**

3. **The role of dietary fibers in the energy metabolism of human colon cancer cells.**
Ounpuu Ljudmila, Klepinin A, Kaambre T.
4. **COX4-1/COX4-2 cell knock-out/knock-in models for study of cytochrome c oxidase regulation.**
Pajuelo Reguera David, Čunátová K, Houštěk J, Mráček T.

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.**

7. **Bioenergetic comparison of human colorectal and breast cancer clinical patients.**

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.**

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.

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**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

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**Topic C:** MitoEAGLE Working Group Meeting: selected topics

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**Session C** Mitochondrial fitness mapping
CHAIRS: Shabalina Irina G, Karabatsiakis 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 Luíz F**  
Short-term adaptation to high altitude does not affect respiration of peripheral blood mononuclear cells and platelets

16:10 – 16:20 **Karabatsiakis 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 Timea**  
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


10:30 – 11:00 Coffee break

11:00 – 12:30 WG2: MitoEAGLE data repository on muscle tissues
CHAIRS: Votion Dominique, Garcia-Roves Pablo Miguel

   Human skeletal muscle mitochondrial function: A proposal for a state-of-the-art literature review

   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?
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


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

Isolation of rat liver mitochondria for bioenergetic studies

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

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: Moisoi Nicoleta, Crisostomo Luis

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 Moisoi**
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–Lukancyt J, Tokarz–Kupczyk E, Kozubski W.

8. **Poster: Cell-permeable succinate and malonate as research tools**

**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