



MEDIZINISCHE UNIVERSITÄT  
INNSBRUCK



# Respirometry of Permeabilized Muscle Fibres: Towards Quality Assurance in the Diagnosis of Mitochondrial Function

2<sup>nd</sup> MiPNet Workshop 2009, Dec 9-10 (Innsbruck, Austria)

In cooperation with OROBOROS INSTRUMENTS

[www.orooboros.at/index.php?qa-in-respirometry](http://www.orooboros.at/index.php?qa-in-respirometry)

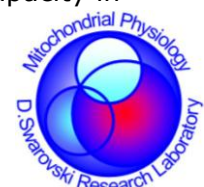
**Location: Frauen-Kopf-Klinik, Med. Univ. Innsbruck  
Lecture Hall 8 (HS 8), 1st Floor  
Entrance: University Hospital (Landeskrankenhaus Innsbruck)**

The schedule of formal presentations includes time for discussions

## Wednesday, December 9

---

- 09:15 Erich Gnaiger (Innsbruck, AT) Welcome – the open spirit of a QA workshop
- Diagnosis of mitochondrial respiratory function: Methods and laboratory protocols, components of QA**
- Chair: Dominique-Marie Votion (Liege, BE)
- 09:30 Erich Gnaiger (Innsbruck, AT) Aspects of quality assurance in respirometry of permeabilized muscle fibres: OXPHOS capacity in human skeletal muscle. (i) OXPHOS capacity at saturating concentrations of ADP and oxygen. (ii) Effect of substrate combinations. (iii) Indices of coupling.
- 10:15 Magnus Hansson, Saori Morota (Lund, SE) Aspects on multititration protocols in human permeabilized heart fibers and platelets.
- 10:45 Coffee
- Chair: Magnus Hansson (Lund, SE)
- 11:30 Martin Mogensen (Copenhagen, DK) Preliminary comparison of Oroboros and Hansatech respiratory measurements in isolated mitochondria.
- 12:00 Robert Boushel (Copenhagen, DK) Effects of PG and NO inhibition on muscle oxygen consumption in-vivo and in permeabilized fibres: Experimental design and protocols.
- 12:30 Lunch
- Mitochondrial respiratory function and capacity: body mass index - endurance or obesity**
- Chair: Robert Boushel (Copenhagen, DK)
- 14:00 Flemming Dela (Copenhagen, DK) Mitochondrial respiration in human subcutaneous and visceral adipose tissue.
- 14:30 Erich Gnaiger (Innsbruck, AT) Fewer mitochondria - mitochondrial 'fever':- Quantitative relations between BMI, ergometric performance and OXPHOS capacity in human skeletal muscle.
- 15:00 Pablo M Garcia-Roves (Stockholm, SE) Constitutively active calcineurin in skeletal muscle increases endurance performance and mitochondrial respiratory capacity. Comparison of mitochondrial respiratory capacity in different muscle types.



- 15:30 Guy HEJ Vijgen (NL) Skeletal muscle fibre responses in morbidly obese subjects.  
16:00 Coffee
- Chair: Flemming Dela (Copenhagen, DK)
- 17:00 Joris Hoeks (Maastricht, NL) Prolonged fasting-induced insulin resistance in humans is accompanied by a decreased mitochondrial capacity.
- 17:30 Pablo M Garcia-Roves (Stockholm, SE) Novel insights into mitochondrial function in a genetic model of obesity: the db/db mouse.
- 18:00 Dan Kane (Greenville, NC, USA) Hormonal considerations and skeletal muscle mitochondrial function in women: focus on estrogen and progesterone.  
18:30 Coffee
- Chairs: Alexander Hüttenhofer, Martin Burtscher (Innsbruck, AT)
- 19:00 Dominique Marie Votion (Liege, BE) Muscle mitochondrial respiratory function measured in small samples from needle biopsies: applications in endurance sport and myopathic horses.
- 20:00 Reception at the *MiP Art Gallery* – OROBOROS INSTRUMENTS – Schöpfstr. 18

## Thursday, December 10

### Towards Quality Assurance in the Diagnosis of Mitochondrial Function

Frauen-Kopf-Klinik, Lecture Hall 8 (HS 8), 1st Floor

- Chair: Erich Gnaiger (Innsbruck, AT)
- 09:15 David K Harrison (Newcastle, UK) Some general principles of quality assurance: From research to clinical investigations, with particular reference to diagnosis in peripheral arterial occlusive disease (PAOD).
- 10:00 Workshop discussion: Perspectives of quality assurance in mitochondrial functional diagnosis.  
10:45 Coffee
- Chair: David K Harrison (Newcastle, UK)
- 11:15 Erich Gnaiger (Innsbruck, AT) Evidence-based instrumental resolution of oxygen flux – possible pathways towards QA.
- 11:45 Workshop discussion: *Is a QA working group required – formal or continuing informal? Should the MiP society launch a project? Which other societies could be integrated (ERNDIM, SSIEM, UMDf, )?*  
12:30 Lunch

### Instrumental demo: Oxygraph-2k and titration feedback control – MiR06 – Experimental perspectives

OROBOROS INSTRUMENTS, Schöpfstr. 18

- 14:00 Mario Fasching and Dominik Pesta (Innsbruck, AT) Automatic control of oxygen regimes for instrumental background - MiR06.
- 15:00 Dominik Pesta (Innsbruck, AT), Dan Kane (Greenville, NC, USA) Case report: Initiation of a project linking mitochondrial function with P-NMR in the context of a hypoxia-normoxia training study on human skeletal muscle.
- 15:30 Wenchich Laszlo (Prague, CZ) Problems of tissue sampling: Inadequate handling may lead to misinterpretation of the results.
- 15:30 Erich Gnaiger (Innsbruck, AT), Robert Boushel (DK) Functional criteria for elimination of outliers in a study on permeabilized fibres from human skeletal muscle – an optimization strategy.  
16:00 Coffee / Transfer to the airport (some participants)
- 17:00 Draft of Workshop Summary

**Contact:** Erich Gnaiger, Email: [erich.gnaiger@i-med.ac.at](mailto:erich.gnaiger@i-med.ac.at)

