



Course on High-Resolution Respirometry

IOC82 Mitochondrial Physiology Network 18.11: 1-2 (2013)
Updates: www.bioblast.at/index.php/MiPNet18.11_IOC82

©2013-2014 OROBOROS®
Version 1: 2013-12-10

82nd Workshop on High-Resolution Respirometry & O2k-Fluorometry

2013 December 10-11
Trondheim, Norway

Satellite to the 5th Seminar on Exercise in Medicine. Trondheim, Norway. 2013 Dec 11-13
» www.ntnu.edu/ceerg/seminar-on-exercise-in-medicine

Contact:

Rognmo Øivind, PhD
Fredrik Hjulstad Bækkerud, PhD-candidate
Cardiac Exercise Research Group
K.G. Jebsen Centre of Exercise in Medicine
Faculty of Medicine, ISB
Norwegian University of Science and Technology (NTNU)
7491 Trondheim
oivind.rognmo@ntnu.no; fredrik.h.bakkerud@ntnu.no

Erich Gnaiger, Prof. PhD^{1,2}
Verena Laner, Mag.¹
¹OROBOROS INSTRUMENTS Corp,
high-resolution respirometry
Schoepfstr 18, A-6020 Innsbruck, Austria - www.orooboros.at
erich.gnaiger@orooboros.at; verena.laner@orooboros.at
²Medical University of Innsbruck
D Swarovski Research Laboratory
A-6020 Innsbruck, Austria



The 82nd Workshop on high-resolution respirometry and O2k-Fluorometry is the **first Oxygengraph-2k Workshop held in Norway**. Most participants are experienced in high-resolution respirometry (**HRR**). The O2k-Workshop includes a basic introduction to quality control of instrumental performance of the **OROBOROS Oxygengraph-2k** with integrated on-line analysis, introducing new features of **DatLab 5.2**.

The main focus will be a discussion on optimization of OXPHOS analysis in various mitochondrial (mt) preparations (permeabilized muscle fibres, tissue homogenate, isolated mitochondria). HRR provides information on cell respiration with simple phosphorylation control protocols. State-of-the-art OXPHOS analysis is extended using mt-preparations, to evaluate coupling efficiencies and OXPHOS capacities with carbohydrate versus fatty acid substrates, and to diagnose defects in respiratory complexes of the electron transfer system and phosphorylation system. Novel developments are presented on **substrate-uncoupler-inhibitor titration (SUIT) protocols** in HRR using the **O2k-Fluorescence LED2-Module** for simultaneous measurement of hydrogen peroxide production (Amplex red®) or mt-membrane potential (Safranin). Discussions are extended on comparison of measurement of mt-membrane potential using Safranin (fluorometric) versus TPP⁺ or TPMP⁺ (potentiometric), and on perspectives of HRR in mitochondrial physiology.

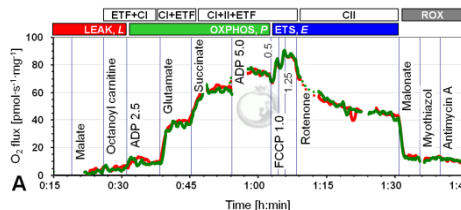
The Cardiac Exercise Research Group (Norwegian University of Science and Technology, Trondheim) is a MiPNet Lab offering their facility and O2ks for the training at the O2k-Workshop.

The MiPNet Lab www.bioblast.at/index.php/NO_Trondheim_Rognmo_O uses three O2k-instruments as a Power-O2k Laboratory.

Programme IOC82 - flexible

Tuesday, December 10:

- 12:15 – 12:45 **Hei! Who is who**
- 12:45 – 13:45 **Pro’s and Con’s of Mitochondrial Preparations: Coupling control and substrate control of respiration and H₂O₂ production in mouse heart: tissue homogenate versus permeabilized fibres – or isolated mitochondria?**
- 13:45 – 14:00 Discussion on experimental protocols for day 2
- 14:00 – 15:00 **Comprehensive OXPHOS analysis: A challenge for the simultaneous measurement of respiration and mt-membrane potential: A puzzle to be solved.**
- 15:00 – 15:15 Discussion on experimental protocols for day 2
- 15:15 Break
- 15:45 – 16:45 **Q&A session on HRR and OXPHOS analysis**
- 16:45 – 17:45 **Experimental setup**



Wednesday, December 11:

- 09:00 **Hands-on: Experiments with rat cardiac/skeletal muscle High-resolution respirometry and O2k-Fluorometry**
- 11.00 Lunch
- 12.00 **Hands-on continued**
- 15.15 Break
- 15:45 – 16:45 **Data analysis and conclusions**

Contact

Erich Gnaiger, PhD
 Medical University of Innsbruck
 D. Swarovski Research Laboratory
 Anichstrasse 35
 A-6020 Innsbruck, Austria
 Email erich.gnaiger@oroboros.at

www.bioblast.at
www.mipart.at



OROBOROS INSTRUMENTS Corp
 Schöpfstrasse 18
 A-6020 INNSBRUCK, Austria
 T +43 512 566796
 F +43 512 566796 20
 Email instruments@oroboros.at
 Homepage: www.oroboros.at

Bioblast

wiki.oroboros.at - the *information synthase* for Mitochondrial Physiology and high-resolution respirometry:

[http:// www.bioblast.at](http://www.bioblast.at)



Contribution to K-Regio *MitoCom Tyrol*.

