



## Course on High-Resolution Respirometry

**IOC90** Mitochondrial Physiology Network 19.05: 1-2 (2014)  
Updates: [www.bioblast.at/index.php/MiPNet19.05\\_IOC90](http://www.bioblast.at/index.php/MiPNet19.05_IOC90)

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## Applied Workshop - High-resolution respirometry and mitochondrial function under hypoxia: overview, demo experiment and discussion.

**2014 May 27**  
**Bolzano, IT**

Congress workshop: ISMM2014  
Bolzano, IT. 2014 May 25-31  
» [ismm2014.org](http://ismm2014.org)

### Venue:

European Academy of Bolzano/Bozen (EURAC)  
Viale Druso, 1/ Drususallee 1  
39100 Bolzano/ Bozen – Italy

### Lecturers and tutors:

Erich Gnaiger, Ao.Univ.-Prof. PhD  
Mona Fontana-Ayoub, Biomedical Assistant  
Sandra Fleischmann, MSc.  
**OROBOROS INSTRUMENTS Corp**  
high-resolution respirometry  
[www.oroboros.at](http://www.oroboros.at)  
[erich.gnaiger@oroboros.at](mailto:erich.gnaiger@oroboros.at); [mona.fontana@oroboros.at](mailto:mona.fontana@oroboros.at);  
[sandra.fleischmann@oroboros.at](mailto:sandra.fleischmann@oroboros.at)

The 90<sup>th</sup> O2k-Workshop introduces high-resolution respirometry and O2k-Fluorometry and presents a real-time demoexperiment on mitochondrial respiration and H<sub>2</sub>O<sub>2</sub> production under hypoxia. Several participants of the Mitochondrial Session (Monday) will discuss general and specific methodological aspects of applications of the OROBOROS Oxygraph-2k in the context of hypoxia and hypothermia. A final round table discussion is aimed at extending a network on research on 'Clinical Hypothermia and Mitochondrial Function'.



## Workshop Programme IOC90

**Tuesday, May 27, 14:00-17:30**

**14:00 – 14:45**

**Introduction**

**14:45 – 15:30**

**Demo experiment:** mitochondrial respiration and H<sub>2</sub>O<sub>2</sub> production under hypoxia

*15:30 – 16:00*

*Coffee break*

**16:00 – 16.45**

**Round table discussion:** Experience with mitochondrial respiration taking the Oxygraph-2k to >4,000 m.

**16:45 – 17:30**

**Round table discussion:** "Clinical Hypothermia and Mitochondrial Function"





### Workshop registration:

**Online:** verena.laner@oroboros.at

**On-site:** OROBOROS exhibition booth

## Join the mito-session: Monday, May 26, 14:00-15:30

| SESSION C – Mitochondria – Key organelle for bioenergetics in hypoxia and cold? E Gnaiger/ R Boushel |  |
|--|--|
| 20 min   | <b>Hypoxia – is mitochondrial capacity and efficiency an issue?</b><br>E Gnaiger (Austria)   |
| 20 min   | <b>Contribution of convective O<sub>2</sub> supply, diffusion and mitochondrial OXPHOS capacities to maximal oxygen consumption at high altitude</b><br>R Boushel (Sweden)   |
| 20 min   | <b>Enhanced fatty acid oxidation capacity and phosphorylation control of human skeletal muscle mitochondria following 16 days at 5260 m</b><br>A Chicco (United States)  |
| 20 min   | <b>Muscle mitochondrial function in Sherpas</b><br>A Murray (United Kingdom)   |
| 10 min   | <b>007-O Human skeletal muscle mitochondria at high-altitude: adaptation and acclimatization</b><br>J Horscroft, A Kotwica, V Laner, E Gilbert-Kawai, D Howard, H Montgomery, M Grocott, D Levett, E Gnaiger, D Martin, A Murray |

## Recommended reading

Gnaiger E, Méndez G, Hand SC (2000) High phosphorylation efficiency and depression of uncoupled respiration in mitochondria under hypoxia. *Proc Natl Acad Sci U S A* 97: 11080-5.

### SUIT protocols for high-resolution respirometry

Pesta D, Gnaiger E (2012) High-resolution respirometry. OXPHOS protocols for human cells and permeabilized fibres from small biopsies of human muscle. *Methods Mol Biol* 810: 25-58. [»Bioblast Access](#)

Gnaiger E (2008) Polarographic oxygen sensors, the oxygraph and high-resolution respirometry to assess mitochondrial function. In: *Mitochondrial Dysfunction in Drug-Induced Toxicity* (Dykens JA, Will Y, eds) John Wiley: 327-52. [»Bioblast Access](#)

### HRR and O2k-Fluorometry

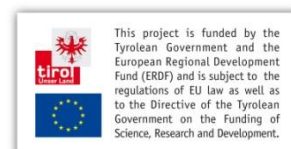
#### »O2k-Fluorescence LED2-Module

Eigentler A, Fontana-Ayoub M, Gnaiger E (2013) O2k-Fluorometry: HRR and H<sub>2</sub>O<sub>2</sub> production in mouse cardiac tissue homogenate. *Mitochondr Physiol Network* 18.05(01): 1-6.

#### »O2k-Fluorometry

### Mitochondrial pathways

Gnaiger E (2014) Mitochondrial pathways and respiratory control. An introduction to OXPHOS analysis. 4th ed. *Mitochondr Physiol Network* 19.12. OROBOROS MiPNet Publications, Innsbruck: 80 pp. [»Open Access](#)



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