



Course on High-Resolution Respirometry

IOC90 Mitochondrial Physiology Network 19.05: 1-2 (2014)
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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

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
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The 90th O2k-Workshop introduces high-resolution respirometry and O2k-Fluorometry and presents a real-time demoexperiment on mitochondrial respiration and H₂O₂ 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 H₂O₂ 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	Hypoxia – is mitochondrial capacity and efficiency an issue? E Gnaiger (Austria)
20 min	Contribution of convective O₂ supply, diffusion and mitochondrial OXPHOS capacities to maximal oxygen consumption at high altitude R Boushel (Sweden)
20 min	Enhanced fatty acid oxidation capacity and phosphorylation control of human skeletal muscle mitochondria following 16 days at 5260 m A Chicco (United States)
20 min	Muscle mitochondrial function in Sherpas A Murray (United Kingdom)
10 min	007-O Human skeletal muscle mitochondria at high-altitude: adaptation and acclimatization 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: 11080-11085.

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: 327-352. [»Bioblast Access](#)

HRR and O2k-Fluorometry

»[O2k-Fluorescence LED2-Module](#)

Eigentler A, Fontana-Ayoub M, Gnaiger E (2013) O2k-Fluorometry: HRR and H₂O₂ production in mouse cardiac tissue homogenate. Mitochondr Physiol Network 18.05(01): 1-6.

»[O2k-Fluorometry](#)

Mitochondrial pathways

Gnaiger E (2012) Mitochondrial pathways and respiratory control. An introduction to OXPHOS analysis. 3rd ed. Mitochondr Physiol Network 17.18. OROBOROS MiPNet Publications, Innsbruck: 64 pp. [»Open Access](#)