

118th Workshop on high-resolution respirometry

2017 February 07-08
Hyderabad, IN

Venue:

The Centre for Cellular & Molecular Biology (CCMB)
Uppal Road, Hyderabad
500007, AP, India

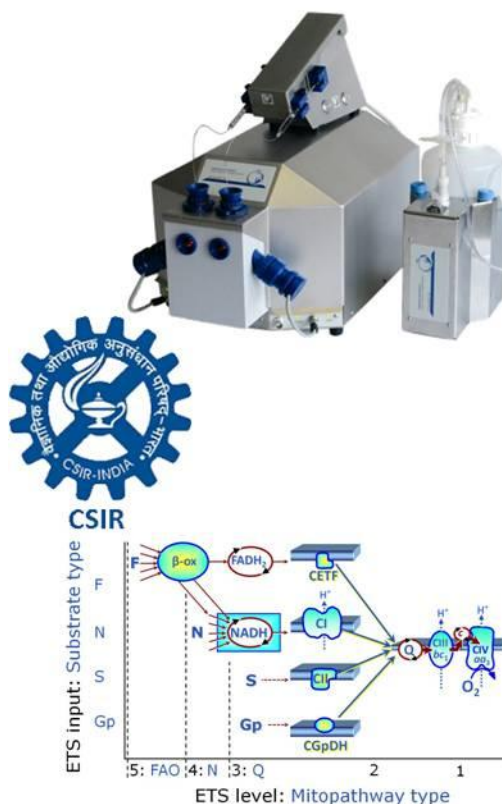
Host:

Kumarasamy Thangaraj, Prof., PhD
The Centre for Cellular & Molecular Biology (CCMB)
Evolutionary and Medical Genetics Laboratory
Centre for Cellular and Molecular Biology
thangs@ccmb.res.in
http://wiki.oroboros.at/index.php/IN_Hyderabad_Thangaraj_K

Lecturer and tutor:

Erich Gnaiger, Ao. Univ.-Prof. PhD
OROBOROS INSTRUMENTS
Schoepfstr 18, A-6020 Innsbruck, Austria - www.oroboros.at
erich.gnaiger@oroboros.at

Rajan Kumar Jha, PhD student - rajanmonuj@gmail.com
The Centre for Cellular & Molecular Biology (CCMB)



The **118th O2k-Workshop** on high-resolution respirometry is held in cooperation with the O2k-Network Lab at **The Centre for Cellular & Molecular Biology (CCMB)**. This O2k-Workshop presents a basic introduction to the **OROBOROS Oxygraph-2k (O2k)** with integrated real-time data analysis. We introduce the new software **DatLab 7** and the concept of a quality control system including the MitoFit interlaboratory proficiency test.

HRR provides information on cell respiration with basic coupling control protocols. State-of-the-art OXPHOS analysis is extended using mt-preparations (permeabilized muscle fibres, tissue homogenate, isolated mitochondria), to evaluate coupling efficiencies and OXPHOS capacities with electron transfer into the Q-junction converging from NADH, FADH₂, succinate and α-glycerophosphate (N,F,S,Gp), to diagnose defects in respiratory electron transfer system pathways and the phosphorylation system. Novel developments are presented on **substrate-uncoupler-inhibitor titration (SUIT) protocols** in HRR. Mitochondria and cell research with the O2k provides the basis for a global network connected by the O2k-technology. The quality control system presented for high-resolution respirometry provides an important milestone on the way to much broader goals.

This O2k-Workshop takes place prior to [SMRM2017 in New Delhi, IN](http://www.srmr2017.com/).
A separate registration is required. <http://www.srmr2017.com/>



Programme

1 Tuesday, Feb 07

*printed in workshop materials

Workshop Day 1		Weblink
09:00	<i>Registration</i>	
09:30-09:45	A welcome by Prof. Kumarasamy Thangaraj and OROBOROS INSTRUMENTS	
09:45-10:00	Introduction of participants and their research interests	IOC118
10:00-11:00	Get started with the O2k: Overview with video clips.	O2k-Manual
11:00	<i>Coffee/tea break</i>	
11:30-13:00	Principles of high-resolution respirometry: From switching on the O2k to the experimental result – oxygen sensor calibration and quality control.	POS-calibration-SOP
13:00	<i>Lunch</i>	
14:00-15:30	Comprehensive OXPHOS analysis: substrate-uncoupler-inhibitor titration (SUIT) protocols for respiratory control by coupling and mitochondrial pathways, SUIT reference assay.	The Blue Book* SUIT reference protocol
15:30	<i>Coffee/tea break</i>	
16:00-18:00	Demo-Experiment: High-resolution respirometry with freeze-dried yeast.	Yeast: HRR Reference Assay

2 Wednesday, Feb 08

Workshop Day 2		Weblink
08:30-11:00	Demo-Experiment	
11:00	<i>Coffee break</i>	
11:30-13:00	HRR experiments – discussion of conceptual and technical details and Hands-on data analysis	
13:00	<i>Lunch</i>	
14:00-15:30	Technical support and open innovation	Technical support
15:30	<i>Coffee break</i>	
16:00-17:00	Q&A session on HRR and OXPHOS analysis: Design of experimental protocols	SUIT protocols
17:00-17:30	The Bioblast wiki, O2k-Network and MITOEAGLE - feedback & conclusions	MITOEAGLE
17:30-19:30	<i>Farewell activity</i>	



Recommended reading

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.

»[Full text in Bioblast](#)«



O2k-Core Manual:

»[Full text in Bioblast](#)«



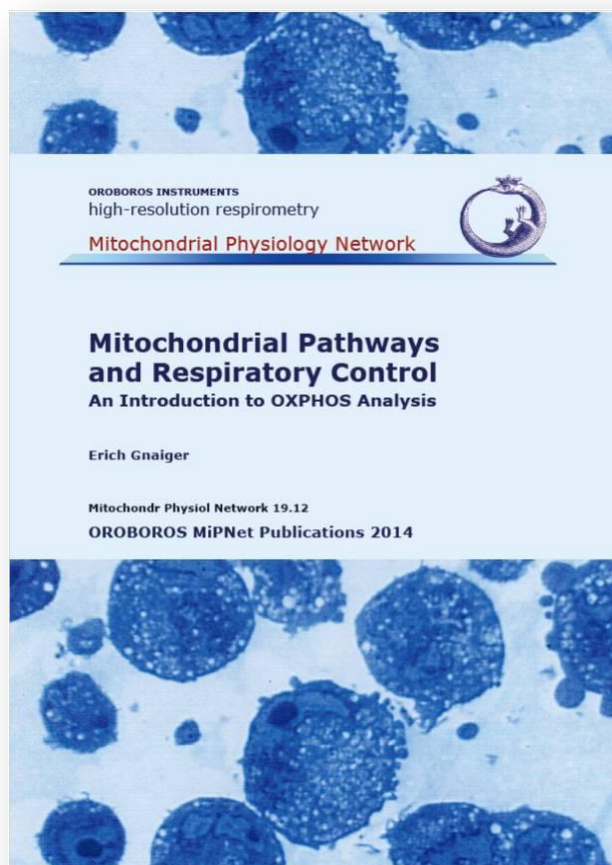
SUIT protocols for O2k high-resolution respirometry

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.

»[Full text in Bioblast](#)«

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.

»[Full text in Bioblast](#)«



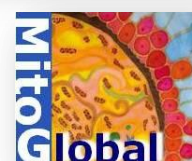
HRR with brain tissue

Burtscher J, Zangrandi L, Schwarzer C, Gnaiger E (2015) Differences in mitochondrial function in homogenated samples from healthy and epileptic specific brain tissues revealed by high-resolution respirometry. Mitochondrion 25:104-12. »[Bioblast link](#)«



COST Action CA15203 Mitochondrial fitness mapping
MITOEAGLE: Evolution - Age - Gender - Lifestyle - Environment

Invitation to join the global network.



Contribution to K-Regio project **MitoFit**. The project MitoFit is funded by the Land Tirol within the program K-Regio of Standortagentur Tirol. www.mitofit.org

