

Oroboros O2k-Workshop

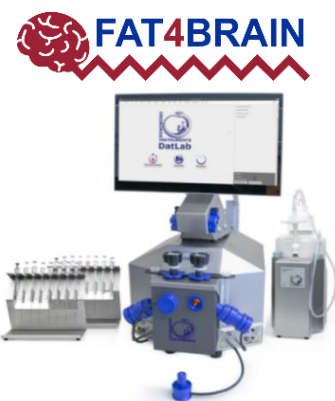


Mitochondrial Physiology Network 28.04(01):1-6 (2023)

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Updates: https://wiki.orooboros.at/index.php/MiPNet28.04_FAT4BRAIN_IOC159_Riga_LV

FAT4BRAIN 159th O2k-Workshop – HRR for the assessment of mitochondrial bioenergetics



2023 Apr 19
Riga, Latvia

Satellite to the **FAT4BRAIN symposium** in Riga, the **O2k-Workshop - HRR for the assessment of mitochondrial bioenergetics** will cover **high-resolution respirometry (HRR)**, covering from concepts to practice in bioenergetics, experimental design and reproducibility, including sessions on data analysis and discussion.



The [Blue Book](#) and [Mitochondrial Physiology](#) provide a basic introduction to mitochondrial bioenergetics, complementing the training course, and therefore we recommend reading them beforehand.

The 159th workshop program was prepared based on questions and topics proposed by the participants and is a unique opportunity to learn about the new developments in HRR.

Lecturers and tutors

Cardoso Luiza	Mitochondrial Wizard, Oroboros Instruments
Gnaiger Erich	CEO, Innovation Alchemist, Oroboros Instruments
Grings Mateus	Mitochondrial Jedi, Oroboros Instruments
Seminotti Bianca	Research Scientist, University of Pittsburgh



Program

From concepts to practice in bioenergetics			
09:00-09:30	<i>Welcome - Get-together: Introduction of participants and their research interests</i>		
09:30-10:15	Coupling control and electron-transfer pathways with focus on fatty acid oxidation: harmonized terminology and CII ambiguities	Mitochondrial physiology Gnaiger 2023 MitoFit CII	Erich
10:15-10:45	<i>Coffee Break and discussions</i>		
10:45-11:30	Sample preparation: tissues from muscle to brain	MitoPedia: Sample preparations	Mateus Luiza
11:30-12:15	Permeabilized fibers	MitoPedia: Permeabilized muscle fibers Fiber permeabilization Gnaiger 2015 Scand J Med Sci Sports	Erich
12:15-13:45	<i>Lunch break</i>		

Experimental design and reproducibility			
13:45-14:15	Experimental design and normalization	Mitopedia: Normalization of rate	Erich
14:15-15:00	Performance, reproducibility, outliers	Reproducibility crisis Baglivo BEC 2022.8 DatLab oxygen flux: performance and data analysis	Mateus Luiza
15:00-15:30	<i>Coffee Break and discussions</i>		
15:30-16:30	Data Analysis: Efficiencies, additivity, bioenergetic cluster analysis	Blue book MitoPedia: Respiratory control ratios Additivity Gnaiger 2021 MitoFit BCA	Erich
16:30-17:30	ETS and fatty acid oxidation enzymes: a multifunctional mitochondrial protein complex	Wang et al. 2010 Wang et al. 2019	Bianca Seminotti
17:30-18:00	<i>Final discussion</i>		

List of participants

Bahire Ksenija	University of Latvia, LV
Dambrova Maija	LV Riga Liepins E - Latvian Institute of Organic Synthesis, LV****
Degtjarjovs Nikolajs	Latvian Institute of Organic Synthesis, LV
Dimitrijevs Pavels	Latvian Institute of Organic Synthesis, LV
Dvořák Ales	CZ Prague Dvorak A - Charles University, CZ*
Kletnieks Ugis	Latvian Longevity Association, LV
Korzh Stanislava	LV Riga Liepins E - Latvian Institute of Organic Synthesis, LV****
Liepins Edgars	LV Riga Liepins E - Latvian Institute of Organic Synthesis, LV****
Liepins Janis	University of Latvia, LV
Margevica Anastasija	University of Latvia, LV
Pilipenko Vladimirs	University of Latvia, LV
Pospíšilová Katerina	CZ Prague Dvorak A - Charles University, CZ*
Rostoka Evita	University of Latvia, LV
Svalbe Baiba	Latvian Institute of Organic Synthesis, LV
Videja Melita	LV Riga Liepins E - Latvian Institute of Organic Synthesis, LV****
Zizalova Katerina	Charles University, CZ
Zvejniece Liga	Latvian Institute of Organic Synthesis, LV
	Latvian Institute of Organic Synthesis, LV
	Latvian Institute of Organic Synthesis, LV
	Latvian Institute of Organic Synthesis, LV

*Asterisks indicate the number of O2k instruments in the participant's lab.

Venue and Accommodation

Wellton Riverside SPA Hotel - Marstalu Hall

33, 11. Novembra krastmala, Riga LV

> <https://www.wellton.com/en/hotels/wellton-riverside-spa-hotel>

More detail?

Gnaiger E (2020) **Mitochondrial pathways and respiratory control.**

An introduction to OXPHOS analysis. 5th ed. Bioenerg

Commun 2020.2. <https://doi.org/10.26124/bec:2020-0002>



Gnaiger E et al – MitoEAGLE Task Group (2020) **Mitochondrial physiology.** Bioenerg

Commun 2020.1. <https://doi.org/10.26124/bec:2020-0001.v1>

O2k-Manual - <http://wiki.oroboros.at/index.php/O2k-Manual>

O2k-Procedures - <http://wiki.oroboros.at/index.php/O2k-Procedures>

>4,200 **O2k-Publications** - <http://wiki.oroboros.at/index.php/O2k-Publications: Topics>

Acknowledgements

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MitoFit Preprints



The Open Access preprint server for mitochondrial physiology and bioenergetics

» https://www.mitofit.org/index.php/MitoFit_Preprints

Bioenergetics Communications



The Open Access journal for publishing scientific and technical advances in bioenergetics and mitochondrial physiology as [Living Communications](https://www.bioenergetics-communications.org)

» <https://www.bioenergetics-communications.org>

Contact

Erich Gnaiger, PhD
Oroboros Instruments GmbH
Schoepfstrasse 18
A-6020 Innsbruck, Austria
T +43 512 566796 F +43 512 566796 20
instruments@orooboros.at | www.orooboros.at
Mitochondria and cell research



Virtual O2k-Workshops are listed as [MitoGlobal Events](https://www.mitoglobal.org)

The Next World-Summits on Mitochondrial Physiology and Bioenergetics



MiP
Mitochondrial
Physiology
school 2023

13th MiPschool
Mitochondrial Physiology
2023 July 23-27
Oberurgl, Austria

www.mitophysiology.org

MiP
Mitochondrial
Physiology
2023

15th MiPconference
Bioenergetics Communications on mitObesity
2023 July 27-30
Oberurgl, Austria
20 years MiPsociety

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EBEC
2024

22nd European Bioenergetics
Conference

2024 August 26-31
Congress Innsbruck, Austria
www.ebec2024.org



NextGen O2k – Applications



Find solutions to

- Cancer
- Obesity
- Diabetes
- Aging
- Cardiovascular
- Neurodegeneration
- Exercise physiology
- Environmental physiology
- PhotoBiology
- Algal biotechnology

»explore

- O₂ consumption
- Q-redox state
- NAD(P)H redox state
- Oxygen dependence
- Hypoxia and O₂ kinetics
- H₂O₂ production
- mt-Membrane potential
- ATP production
- pH, Ca²⁺, NO[•]
- Photosynthesis
- Dark respiration
- Light-enhanced respiration

Oroboros - as a driving force in mitochondrial physiology - extends the analytical and diagnostic power of high-resolution respirometry by integration of NADH- and Q-redox monitoring in the **NextGen-O2k**. We aim at establishing the Oroboros quality control management for dissemination to our worldwide O2k-Network laboratories. This will become an effective contribution to address the acute *reproducibility crisis* of scientific investigation. In the spirit of Open Science and global networking, we will enable data sharing across projects and institutions in an Open Access database on mitochondrial physiology and pathology, to resolve the *inflation crisis* and ultimately the *value-impact crisis* of present academic publication. This will support key developments in mitochondrial medicine. In addition, we expand our business to algal biotechnology and ecology with the NextGen-O2k PhotoBiology-Module, widening our focus from medicine to environment and climate.