Oroboros O2k-Workshop

O2k-Coaching Days 158th O2k-Workshop on high-resolution respirometry

2023 Feb 27 – Mar 01
Innsbruck, Tyrol, Austria

O2k-Coaching Days is a training course which provides a fundamental introduction to **high-resolution respirometry (HRR)** with the Oroboros O2k. It will give an overview of the **O2k**, including real-time analysis with **DatLab 8** and applications of the **Titration-Injection microPump TIP2k**. Hands-on sessions, using one O2k per participant, range from instrumental setup and service of the polarographic oxygen sensor (**OroboPOS)**, instrumental quality control system, to respirometry experiments with substrate-uncoupler-inhibitor (SUIT) protocols using HEK 293T cells as the biological sample. Many optimized SUIT protocols are available as DL-Protocols and will be shown at the Coaching Days, as well as the **SUITbrowser,** which helps you find the best SUIT protocol for your specific research questions. 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 158th workshop 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
Gürth Patrizia	Laboratory Technician, Oroboros Instruments
Timón-Gómez Alba	Mitochondrial Mage, Oroboros Instruments

Program

1   Monday, Feb 27

	O2k Basic – quality control	Weblink	Room
08:30-09:00	*Welcome - Get-together: Introduction of participants and their research interests*		*MiPArt*
09:00-09:20	**OroboPOS service and O2k instrumental setup** - overview with videoclips	O2k-FluoRespirometer O2k-Videosupport	*Oroboros O2k-Laboratory*
09:20-10:40	**Hands-on** (2 groups) OroboPOS service and O2k instrumental setup	POS Service O2k-Start	*Oroboros O2k-Laboratory*
10:40-11:00	**DatLab 8 overview**	Getting started with DatLab	*MiPArt*
11:00-11:30	**Instrumental quality control 1:** oxygen calibration	Gnaiger 2008 POS SOP: O2-calibration	*MiPArt*
11:30-12:30	**Hands-on:** Instrumental quality control 1: oxygen calibration DL-Protocol: O2k-cleaning BeforeUse DL-Protocol: O2 calibration air	SOP: O2k-cleaning_and_ISS SOP: O2-calibration	*Oroboros O2k-Laboratory*
12:30-13:30	*Lunch break*		
13:30-14:00	**Hands-on:** Instrumental quality control 1: oxygen calibration (continuation). DatLab analysis DL-Protocol: O2 calibration air	Oxygen_calibration SOP: POS calibration	*Oroboros O2k-Laboratory*
14:00-14:30	**Instrumental quality control 2:** Instrumental O2 background – overview with videoclips	SOP: O2 background TIP2k manual	*Oroboros O2k-Laboratory*
14:30-15:30	**Hands-on: Instrumental quality control 2:** Instrumental O2 background DL-Protocol: Instrumental O2 background TiP2k		*Oroboros O2k-Laboratory*
15:30-16:00	*Coffee / Tea*		*MiPArt*
16:00-17:45	**Hands-on:** Instrumental quality control 2 (continuation). DatLab analysis. DL-Protocol: Instrumental O2 background TiP2k		*Oroboros O2k-Laboratory*

2　　Tuesday, Feb 28

	O2k Basic – SUIT protocols	Weblink	Room
08:30-09:10	**Hands-on:** Instrumental quality control 1: oxygen calibration DL-Protocol: O2k-cleaning BeforeUse DL-Protocol: O2 calibration air	SOP: O2k-cleaning_and_ISS SOP: O2-calibration	*Oroboros O2k-Laboratory*
09:10-10:10	**Introduction to substrate-uncoupler-inhibitor titration (SUIT) protocols** – fundamental principles. SUIT reference protocol: RP1&RP2	MitoPedia: SUIT	*Oroboros O2k-Laboratory*
10:10-10:25	**SUITbrowser:** how to find the best SUIT protocol for your research questions.	Oroboros SUITbrowser	*Oroboros O2k-Laboratory*
10:25-10:30	**Hands-on:** Instrumental quality control 1: oxygen calibration DL-Protocol: O2 calibration air	SOP: O2-calibration	*Oroboros O2k-Laboratory*
10:30-10:45	*Coffee / Tea*		*MiPArt*
10:45-12:45	**Hands-on:** O2k-experiment: Respiration of permeabilized cells: measurement of oxygen consumption with the reference protocol RP1 (SUIT-001) and RP2 (SUIT-002). DL-Protocol: SUIT-001 O2 ce-pce D003.DLP DL-Protocol: SUIT-002 O2 ce-pce D007.DLP	SUIT reference protocols SUIT-001 O2 ce-pce D003 SUIT-002 O2 ce-pce D007	*Oroboros O2k-Laboratory*
12:45-13:00	**Hands-on:** O2k-cleaning after use DL-Protocol: O2k-cleaning AfterUse	SOP: O2k-cleaning_and_ISS	*Oroboros O2k-Laboratory*
13:00-14:00	*Lunch break*		
14:00-14:30	**Hands-on:** O2k-cleaning after use (continuation) DL-Protocol: O2k-cleaning AfterUse		*Oroboros O2k-Laboratory*
14:30-15:30	**DatLab analysis:** Introduction and new features **Hands-on: Individual DatLab analysis** – O$_2$ flux	Oxygen flux analysis	*Oroboros O2k-Laboratory*
15:30-16:00	*Coffee / Tea*		*MiPArt*
16:00-17:30	**DatLab analysis summary**		*MiPArt*

3   Wednesday, Mar 01

	O2k Basic – proficiency test	Weblink	Room
08:30-10:00	**MitoFit proficiency test** **Hands-on:** Instrumental quality control 1: oxygen calibration DL-Protocol: O2k-cleaning BeforeUse DL-Protocol: O2 calibration air	SOP: O2k-cleaning_and_ISS SOP: O2-calibration	*Oroboros O2k-Laboratory*
10:00-10:30	*Coffee / Tea*		*MiPArt*
10:30-12:15	**MitoFit proficiency test** **Hands-on:** O2k-experiment: Respiration of permeabilized cells: measurement of oxygen consumption with the reference protocol RP1 (SUIT-001) and RP2 (SUIT-002). DL-Protocol: SUIT-001 O2 ce-pce D003.DLP DL-Protocol: SUIT-002 O2 ce-pce D007.DLP	SUIT reference protocol SUIT-001 O2 ce-pce D003 SUIT-002 O2 ce-pce D007	*Oroboros O2k-Laboratory*
12:15-12:45	**Hands-on:** O2k-cleaning after use DL-Protocol: O2k-cleaning AfterUse	SOP: O2k-cleaning_and_ISS	*Oroboros O2k-Laboratory*
12:45-13:45	*Lunch break*		
13:45-14:00	**Hands-on:** O2k-cleaning after use (continuation) DL-Protocol: O2k-cleaning AfterUse	SOP: O2k-cleaning_and_ISS	*Oroboros O2k-Laboratory*
14:00-14:45	**Hands-on: DatLab analysis** – O_2 flux	Oxygen flux analysis	*Oroboros O2k-Laboratory*
14:45-15:15	*Coffee / Tea*		*MiPArt*
15:15-15:30	**O2k-Applications - overview**	O2k Applications	*MiPArt*
15:30-16:00	**The Bioblast wiki:** MitoPedia, the Oroboros Ecosystem, O2k Publications and O2k-Network	www.bioblast.at MitoPedia O2k-Publications O2k-Network	*MiPArt*
16:00-17:00	**Proficiency test: DatLab analysis summary**		*MiPArt*
17:00	**Farewell activity**		*MiPArt*

List of participants

Participant	Institution
Hopfauf Denise	**AT_Innsbruck_Weiss G** - Medical University of Innsbruck, AT
Korzh Stanislava	**LV_Riga_Liepins E** - Latvian Institute of Organic Synthesis, LV*****
Pertler Elke	**AT_Innsbruck_Zoller H** - Medical University of Innsbruck, AT
Prime Tracy	**UK_Cambridge_Whitworth A** - University of Cambridge, UK*
Rechner Sunantha Vanessa	**AT Innsbruck Keller M** - Medical University of Innsbruck, AT
Videja Melita	**LV_Riga_Liepins E** - Latvian Institute of Organic Synthesis, LV*****
Vlasakova Tereza	**AT Innsbruck Keller M** - Medical University of Innsbruck, AT

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

Venue and Accommodation

Oroboros O2k-Laboratory
Schoepfstrasse 18, 6020 Innsbruck
    > How to get there

Hotel suggestion:
Basic Hotel Innsbruck
    > https://www.basic-hotel.at/en/

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

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

The Next World-Summits on Mitochondrial Physiology and Bioenergetics

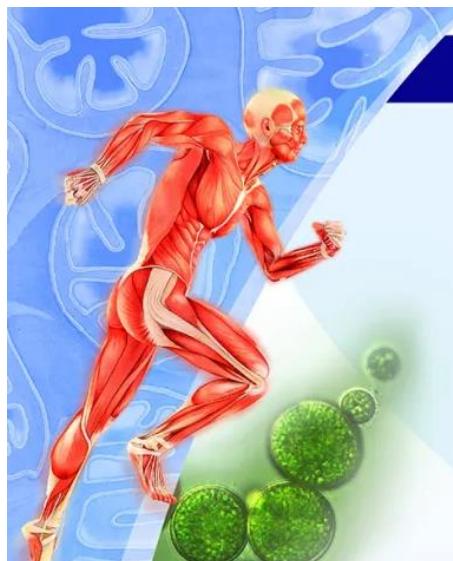Become a MiP*member* now and join our MiP*events*
   » www.mitophysiology.org

22nd European Bioenergetics Conference

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

NextGen O2k – Applications

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.

Contact

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Mitochondria and cell research

Virtual O2k-Workshops are listed as MitoGlobal Events