

# Oroboros **FAT4BRAIN Virtual O2k-Workshop**



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Version 01: 202-01-26 NextGen-O2k DatLab 7 ©2021 Oroboros

Updates: [https://wiki.orooboros.at/index.php/FAT4BRAIN\\_O2k-Workshop\\_IOC148\\_Virtual\\_Event](https://wiki.orooboros.at/index.php/FAT4BRAIN_O2k-Workshop_IOC148_Virtual_Event)

## FAT4BRAIN Virtual O2k-Workshop Basic



The **Oroboros O2k-Workshop on high-resolution respirometry (HRR)** provides an overview of the **O2k-FluoRespirometer**, including data analysis by **DatLab 7.4**. This provides a unique opportunity to receive a start-up introduction and learn about new developments in HRR.



Via a live video link, Oroboros experts guide you step-by-step on **O2k Quality Control**, an essential component of HRR and hands-on in biological experiment. Instrumental and biological experiments demonstrate the unique advantages and limitations of monitoring of oxygen concentration and respiration.



A wide range of standardized substrate-uncoupler-inhibitor-titration (**SUIT**) protocols is available to address your specific research questions, which can be further customized for application to your biological samples. **Online supporting material** is provided to make it easy for you to use the many features of the DatLab software from instrumental control to the analysis of results.

During the **FAT4BRAIN School IOC147 Virtual Event** topics covered in the **Blue Book** (5<sup>th</sup> edition in prep.) and the MitoEAGLE Bioenergetics Communication **Mitochondrial physiology** were presented and discussed, providing a basic introduction to mitochondrial physiology and protocol design, to get prepared for the **FAT4BRAIN Virtual O2k-Workshop - Basic**. Now the participants will receive hands-on training on the quality controls for high-resolution respirometry and SUIT protocols performance and analysis.



## The Virtual O2k-Workshop is composed of:



Manual

**O2k-Manual:** Repository of online manuals (unlimited access) which guide beginners and experienced users from the instrumental set-up to data analysis.



Videosupport

The **O2k-Videosupport** provides valuable assistance, complementary to the O2k-Manual. These video clips are Open Access. Exclusive videos will also be available for Virtual O2k-Workshop participants.



Procedures

**O2k-Procedures** (unlimited access) explain various applications of the O2k (i.e. mitochondrial pathways, O2k-Demo experiments, O2k-Analysis, chemicals and media, O2k-mitochondrial preparations and mitochondrial and marker-enzymes).



SUIT

**Substrate-uncoupler-inhibitor titration (SUIT) protocols** are applied to living cells and mitochondrial preparations. Oroboros [library of SUIT protocols](#) and the [SUITbrowser](#) offer help to find the best SUIT protocol for your research questions. Instrumental and SUIT **DL-Protocols** (DatLab 7.4 software) provide a guide through the sequence of steps for instrumental and biological experiments. The library of SUIT protocols and the SUITbrowser are available online with unlimited access. DL-Protocols are included in **DatLab 7.4**.



DatLab



MitoPedia

**MitoPedia** includes a continuous development of a consistent nomenclature, terms, abbreviations and concepts in mitochondrial physiology and nonequilibrium thermodynamics, in the spirit of Gentle Science.

BIOENERGETICS  
COMMUNICATIONS

**Bioenergetics Communications** is the Open Access journal for publishing scientific and technical advances in bioenergetics and mitochondrial physiology as Living Communications.



Publications

**O2k-Publications** include relevant information of high-resolution respirometry.



Virtual Coaching

**Virtual coaching** sessions includes tutoring, guidance, questions and discussions.

## Materials for self-study






» [https://wiki.oroboros.at/index.php/Virtual\\_O2k-Workshop\\_study\\_material](https://wiki.oroboros.at/index.php/Virtual_O2k-Workshop_study_material)

It is recommended that participants prepare for the live sessions by going through the self-study material found at the "**Materials for self-study**" file. The content will lead participants through the set-up of the instrument and introduce the field of HRR.






DatLab 7.4 has to be installed on the computer to which the O2k is connected ([O2k-Videosupport: DatLab 7 installation](#)).

## Program

March 3<sup>rd</sup>:

<b>O2k-Basic</b>	
<b>Session</b>	<b>Duration</b>
<b>Part 1.1: DatLab</b>	
<b>08:30-09:30: DatLab overview and hands-on. Questions.</b>	
<b>Part 1.2: O<sub>2</sub> calibration and instrumental background</b>	
<b>09:30-11:00: Hands-on: Quality control 1: Oxygen calibration</b> DL-Protocol: O2k-cleaning BeforeUse DL-Protocol: O2 calibration air * One O2k should be selected to show the traces for those who are present only virtually.	
<b>11:00 – 13:00: Hands-on: Quality control 2: Oxygen background</b> DL-Protocol: Instrumental O2 background manual injections DL-Protocol: O2k-cleaning AfterUse * One O2k should be selected to show the traces for those who are present only virtually.	
<b>13:00: Lunch</b>	
<b>14:00-15:00: DatLab 7.4 analysis and discussion</b>	
<b>Part 2.1: Biological samples and experimental design</b>	
<b>15:00-16:00: Short discussion about SUIT protocols, biological samples, experimental design</b> Get prepared by "Materials for self-study" Section 2.1 The participant should ask questions about SUIT protocols related to their projects (can be sent in advance with an overview of their project)	

## March 4<sup>th</sup>:

<b>Part 2.2: Biological experiment and data analysis</b>	
<p><b>08:30-10:00 Hands-on: Quality control 1: Oxygen calibration</b></p> <p>DL-Protocol: O2k-cleaning BeforeUse DL-Protocol: O2 calibration air</p> <p>* One O2k should be selected to show the traces for those who are present only virtually.</p>	<p>Do-it-yourself 1.5 h</p> 
<p><b>10:00-11:30: Hands-on: Biological experiment: cell or mitochondrial respiration</b></p> <p>DL-Protocol: SUIT protocol will be selected/discussed</p> <p>* One O2k should be selected to show the traces for those who are present only virtually.</p>	
<p><b>11:30-12:30 Hands-on: O2k-cleaning after use</b></p> <p>DL-Protocol: O2k-cleaning AfterUse</p> <p>* One O2k should be selected to show the traces for those who are present only virtually.</p> <p>(Collect the DLD files to send for those who are only online)</p>	<p>Do-it-yourself 1 h</p> 
<b>13:00: Lunch</b>	
<p><b>14:00-15:30: DatLab 7.4 analysis overview and hands-on. Questions.</b></p> <p><b>DatLab performance evaluation. Discussion</b></p>	
<p><b>15:30-16:00: Quiz</b></p>	

## Tutors

<a href="#">Cardoso Luiza</a>	Mitochondrial Wizard, PostDoc, Oroboros Instruments
<a href="#">Cecatto Cristiane</a>	Mitochondrial Phoenix, PostDoc, Oroboros Instruments

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Program prepared by Cecatto C, Cardoso LHD, Doerrier C, Gnaiger E, Tindle-Solomon L, Oroboros Instruments.



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## COST Action CA15203 MitoEAGLE



**Mitochondrial physiology. Gnaiger Erich et al – MitoEAGLE Task Group (2020) Mitochondrial physiology. Bioenerg Commun 2020.1.**

doi:10.26124/bec:2020-0001.v1.

» [Mitochondrial physiology](#)



## MitoFit Preprint Archives



**The Open Access preprint server for mitochondrial physiology and bioenergetics**

» [https://www.mitofit.org/index.php/MitoFit\\_Preprint\\_Archives](https://www.mitofit.org/index.php/MitoFit_Preprint_Archives)

## Bioenergetics Communications

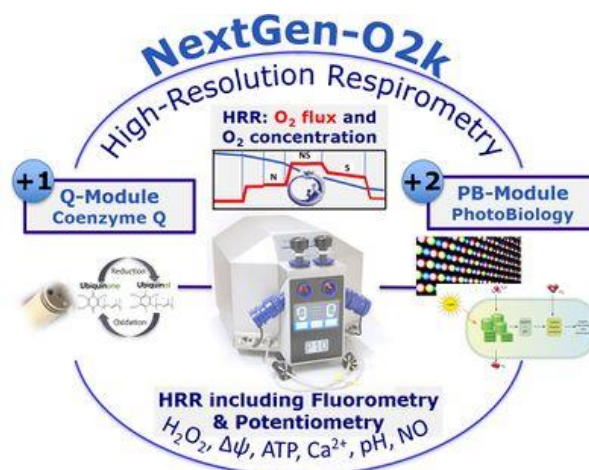


**The Open Access journal for publishing scientific and technical advances in bioenergetics and mitochondrial physiology as [Living Communications](#)**

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

## NextGen O2k

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 photobiology module of the NextGen-O2k, 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](#)