

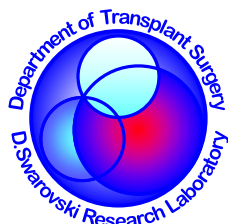


OROBOROS
INSTRUMENTS
www.Oroboros.at

High-Resolution Respirometry

Introductory Course on High-Resolution Respirometry

Programme



Oxygraph Course, Oct. 04-05, 2001

Department of Transplant Surgery, D. Swarovski
Research Laboratory

University Hospital, Innsbruck, Austria

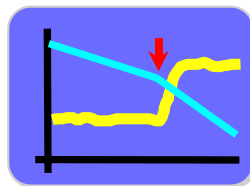
Thursday

09:30



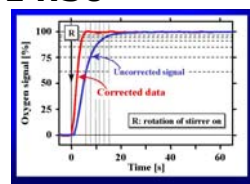
10:45 Coffee

11:15



12:30 Lunch

14:30



19:00 Dinner

October 04

Seminarraum 3, UG1, Chirurgie (main building)

Erich Gnaiger: High-resolution respirometry – the dramatic difference

- Introduction: Measurement of cellular and mitochondrial oxygen consumption.
- Optimum design and function of the polarographic oxygen sensor, respirometer chamber, stirrer, temperature regulation: The OROBOROS *Oxygraph*.
- On-line recording of oxygen concentration and flux; linear slope versus oxygen flux as a function of time.

E. Gnaiger: DatLab Software - Acquisition & Analysis

- Experimental setup: Chamber volume, temperature, stirring, data sampling.
- Calibration of oxygen concentration.
- Display: Resolution, zooming, standardization.
- Instrumental background: measurement and correction as a function of pO_2 .
- High time resolution: Determination of the time constant, dynamic corrections.

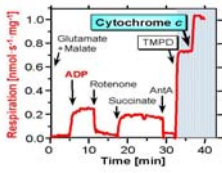
Department of Transplant Surgery, D. Swarovski Research Laboratory (small building opposite dermatology)

OROBOROS Oxygraph - instrumental tests

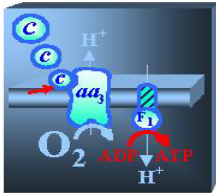
- Experimental set-up, main unit and electronic control unit.
- Chemical sterilization of the *Oxygraph* chamber.
- *DatLab Acquisition*.
- Calibration with mitomedium, stirrer test, and instrumental background.
- *Oxygraph* logbook.

Friday

09:30

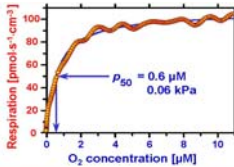


10:00



10:30 Coffee

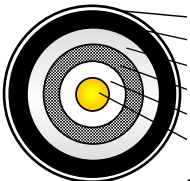
11:00



11:45

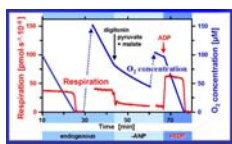
12:30 Lunch

14:30



15:30 Coffee

16:00



18:00

19:00 Dinner

Announcement:

October 05

Seminarraum 3, UG1, Chirurgie (main building)

Andrey Kuznetsov: Functional tests for tissue permeabilization and mitochondrial function.

- Digitonin permeabilization of muscle fibers.
- Mechanical permeabilization of liver tissue.
- Respirometric titration protocols: ADP stimulation and uncoupling.
- Multiple mitochondrial defects.

Kathrin Renner: Apoptosis and mitochondrial function in cultured cells.

- Endogenous respiration and uncoupling control ratio.
- Permeabilization, cytochrome c oxidase activity, and cytochrome c stimulation.
- Cytochrome c oxidase and citrate synthase as reference for mitochondrial content.
- Chemical background – measurement and correction.

Erich Gnaiger: Mitochondrial respiratory control by oxygen and ADP supply

- Measurement at low oxygen: aerobic-anaerobic transitions.
- Measurement at low oxygen: Steady-state oxygen titration.
- ADP kinetics and ADP/O₂ ratios in steady-state versus pulse titrations of ADP.

Discussion of specific applications of high-resolution respirometry

Department of Transplant Surgery, D. Swarovski Research Laboratory (small building opposite dermatology)

OROBOROS Oxygraph - instrumental service

- Polarographic oxygen sensor (POS): Cleaning of anode and cathode.
- POS: electrolyte and membrane application.
- Oxygraph assembly, instrumental maintenance.

OROBOROS Oxygraph – application.

- Demonstration experiment: protocol according to specific interests.
- Trouble shooting.
- DatLab Analysis – practice.
- Graphics.

Summary discussion.

Mitochondrial Physiology Meeting

September 2002, Schröcken, Austria (after EBEC)

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