

Oxygraph-2k Course

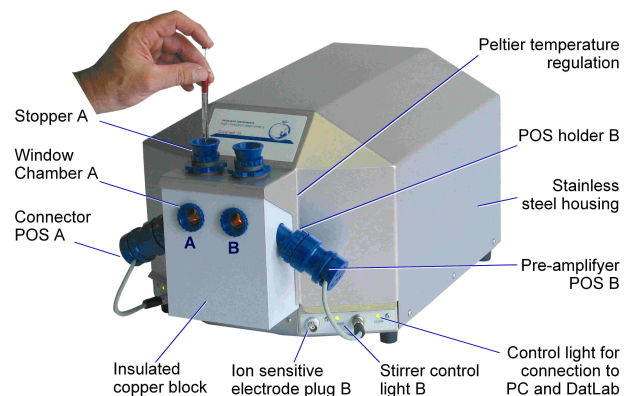
52nd Course on High-Resolution Respirometry

4.5D, June 21, 2009 – 3rd MiPsummer School, Baton Rouge, USA – www.mitophysiology.org

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The **OROBOROS Oxygraph-2k** provides a unique high-resolution approach to the monitoring of cellular and mitochondrial respiratory function. World-wide, the 'O2k' is established as the leading instrument in **mitochondrial respiratory physiology**. High-resolution respirometry (HRR) is superior in routine applications, and is dramatically different to conventional polarography or new semi-quantitative approaches. In addition, HRR has opened up a new dimension for quantitative analysis of low respiratory activities and low oxygen levels. Diagnostic substrate-uncoupler-inhibitor-titration protocols are applied with as little as 2 mg wet weight of permeabilized muscle fibers obtained from a small needle biopsy, or 0.5 million cultured cells such as fibroblasts. The most important biomedical applications include evaluation of mitochondrial and metabolic defects, ischemia-reperfusion injury, oxidative stress, apoptosis, degenerative diseases and aging.

High-resolution respirometry (HRR) with the OROBOROS Oxygraph-2k is an integrative systems approach to polarographic measurement of oxygen dynamics. O₂ concentration and respiration (oxygen flux) are displayed on-line and simultaneously by the DatLab software. The mechanics, critical selection of materials, and state-of-the-art electronics provide the basis



for high signal stability of an optimized polarographic oxygen sensor, in an electronically controlled thermal environment with outstanding temperature stability. Calibrations and instrumental controls follow standardized HRR procedures, with highly automatic on-line analysis.

Recent developments lead to a modular extension of the Oxygraph-2k to the **MultiSensor-O2k** for simultaneous application of O₂ and NO sensors and ion selective electrodes (pH for evaluation of proton fluxes, TPP⁺ for mitochondrial membrane potential, Ca²⁺), and optical methods (cytochrome spectra; spectrofluorimetry). Scientific support by the OROBOROS O2k-Team is complementary to the approach of high-resolution respirometry. Find information on the newest experimental HRR protocols, or search through more than 250 publications on HRR on www.orooboros.at. We invite you to join our O2k-Course for a practical demonstration experiment on high-resolution respirometry. You are welcome in our growing *MiPNet* – the Mitochondrial Physiology Network.