



# BPS2023

67th Biophysical Society Annual Meeting  
February 18–22, 2023

**SAN  
DIEGO**  
CALIFORNIA, USA

**Sunday, February 19**

**9:30AM – 11:00 AM**

**Room 9**

**Oroboros Instruments GmbH**

## **Mitochondrial Bioenergetics – A Quantitative Analytical and Diagnostic Approach**

Mitochondrial fitness is essential for brain and muscle function, for resistance against preventable and age-related degenerative diseases and therefore for quality of life. The capacity of oxidative phosphorylation (OXPHOS) is a fundamental part of mitochondrial fitness and a key element in bioenergetics. Comprehensive and real-time OXPHOS analysis is based on biophysical and biochemical concepts related to mitochondrial core energy metabolism. It extends bioenergetics to the level of mitochondrial physiology for functional diagnosis in health and disease.

The Oroboros O2k is the state-of-the-art respirometer for quantitative high-resolution respirometry (HRR) and comprehensive OXPHOS analysis. It has the high signal stability and unrestricted flexibility of titrations suited for application of complex substrate-uncoupler-inhibitor titration (SUIT) protocols which are the basis for investigating mitochondrial pathways and respiratory control in health and disease. High resolution and precise control of oxygen concentration enable studies of mitochondrial functions under normoxia, hypoxia, and hyperoxia.

With the O2k-FluoRespirometer, fluorometric assays for ROS production, mitochondrial membrane potential, ATP production, and calcium uptake can be measured in real-time and simultaneously in direct conjunction with HRR. Modules for monitoring Q- and NAD-redox states and PhotoBiology are implemented in the NextGen-O2k, further extending the analytical resolution and opening new windows to study biophysical principles of bioenergetics.

We will present applications of the NextGen-O2k and O2k-FluoRespirometer to explore mitochondrial physiology and pathology in various types of samples and find solutions to mitochondria-associated diseases.

### **Speaker**

*Erich Gnaiger, Founder & CEO, Oroboros Instruments GmbH*