Reproducibility and optimization of mitochondrial respiration protocols in microalgae.

Maria Huete-Ortega[1] and Erich Gnaiger[1,2]

[1]Oroboros Instruments, Innsbruck, Austria
[2]Daniel Swarovski Research Lab, Dept of Visceral, Transplant Thoracic Surgery, Medical University of Innsbruck, Austria

Bioenergetics is the study of how living organisms acquire and transform energy to perform biological work. In algae, solar energy is acquired and assimilated through the photosynthesis to synthesize the organic matter required for growth. Meanwhile, mitochondrial respiration transforms the organic matter into the chemical energy required to fuel cellular activity. Energetic and metabolic coupling between chloroplasts and mitochondria have been described in algae, for example mitochondria is involved in mitigating light stress in the photosynthetic pathway. Therefore, a good functionality and cross-talk between both organelles is necessary to maintain the homeostasis. Nowadays, High-Resolution FluoRespirometry (HRFR) to assess for mitochondrial respiration and other bioenergetic parameters is widely used in the biomedical field to study mitochondrial biology and its clinical applications, including degenerative diseases and life style-linked preventive medicine. In this talk, I will summarize preliminary results of the research conducted with the aim of applying the O2k-HRFR in the study of algal bioenergetics for biotechnological purposes.