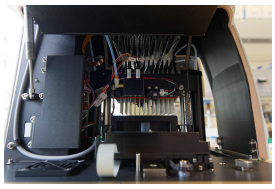
# Seahorse XFe96 analyzer with hypoxic chamber

https://search.labfacilities.wur.nl/SearchDetail.aspx?deviceid=af743041-cbe7-4578-b12e-d6283a423fb2



## Brand

Seahorse Bioscience

## Type

XFe96

## Contact

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## Organisation

Animal Sciences

## Department

Human and Animal Physiology

## Description

The Seahorse XFe96 analyzer has the capability of analyzing cellular metabolism of a wide range of sample types (from cultured cells to model organisms), making it a highly versatile research tool.
Cellular metabolism, the intricate network of pathways providing energy and building blocks, nowadays is the intense focus of both basic and applied research attention. Disturbance of the metabolic network is an underlying mechanism of many diseases in humans, animals and plants. Understanding metabolic imbalances can lead to specific dietary interventions, targeted to prevent disease or to design novel therapies for human and animal diseases.

## Technical Details

The XFe96 analyzer from Seahorse Bioscience (www.seahorsebio.com) measures multiple parameters (O2 and H+) simultaneously using optical biosensors in cell culture microplate assays in real time It is capable of automatically injecting 4 different compounds into the wells, allowing for fast and reproducible measurement of extracellular fluxes before and after injection. Oxygen is consumed during cellular metabolism and extracellular medium is acidified due to excretion of lactic acid produced during glycolysis. O2 and pH flux analysis, combined with injection of compounds targeting metabolism, provides a detailed profile of cellular metabolic phenotype. In the instrument disposable cartridges, embedded with 96 doublets of fluorescent biosensors, are coupled to a fiber-optic waveguide (figure 1). The waveguide delivers light at different excitation wavelengths and transmits the emitted fluorescent signal through optical filters to highly sensitive photodetectors. Our Seahorse is housed inside an hypoxic chamber (Custom made by Coy Lab www.coylab.com) so that real-time analysis of metabolic function can be performed at a wide range of oxygen concentrations (including hypoxia). This allows for analyzing in vitro cellular and organismal metabolic functions at relevant in vivo oxygen levels.

## Applications

• Targeting cellular metabolic pathways with dietary components in cultured cells
• Screening the effect of food components on mitochondrial function and toxicity
• The Seahorse can be exploited to perform as an alternative for metabolic analyses in small animals
• Analyzing metabolism of isolated blood cells or tissue cells after interventions
• Analyzing cellular metabolism of genetically altered C. elegans strains.
• Following metabolism during embryonic development (eg zebrafish)
• Analyzing fermentation in yeast cells for food processing technologies
• Assessment of plant cell metabolism

## *Publications*

Proteomic and biochemical studies of lysine malonylation suggest its malonic aciduria-associated regulatory role in mitochondrial function and fatty acid oxidation, Colak, G.; Pougovkina, O.; Dai, L.; Tan, M.; Brinke, H. te; Huang, H.; Wanders, R.J.; Locasale, J.W.; Lombard, D.B.; Boer, V.C.J. de; Zhao, Y. , Molecular and Cellular Proteomics , http://www.wur.nl/en/Publication-details.htm?publicationId=publication-way-343935313035

SIRT1/PGC1a-dependent increase in oxidative phosphorylation supports chemotherapy resistance of colon cancer, Vellinga, T.T.; Borovski, T.; Boer, V.C.J. de; Kranenburg, O., Clinical Cancer Research , http://www.wur.nl/en/Publication-details.htm?publicationId=publication-way-343935313033

A computational study of the Warburg effect identifies metabolic targets inhibiting cancer migration, Keren Yizhak, Sylvia E Le Dévédec, Vasiliki Maria Rogkoti, Franziska Baenke, Vincent C de Boer, Christian Frezza, Almut Schulze, Bob van de Water and Eytan Ruppin, Molecular Systems Biology, http://onlinelibrary.wiley.com/doi/10.15252/msb.20134993/full

Inhibiting epigenetic enzymes to improve atherogenic macrophage functions, Jan Van den Bossche, Annette E. Neele, Marten A. Hoeksema, Femke de Heij,, Biochemical and Biophysical Research Communications, http://www.sciencedirect.com/science/article/pii/S0006291X14020397