



## Seahorse XFp Extracellular Flux Analyzer

XF TECHNOLOGY FOR EVERY LAB

 *Seahorse Bioscience*

# THE POWER OF XF TECHNOLOGY FOR EVERY LAB

With the XFp Analyzer, it is easier than ever to perform functional metabolic measurements in live cells in your own lab. The instrument has been designed to perform gold-standard metabolic assays reliably and consistently on your precious samples. The compact format of the XFp Analyzer and optimized XFp Miniplate make this new platform ideal for pairwise comparisons to validate your genomic or proteomic data.

**PAIRWISE COMPARISONS • PATIENT-DERIVED SAMPLES • PERSONAL USE**

Sleek, intuitive  
touchscreen operation.

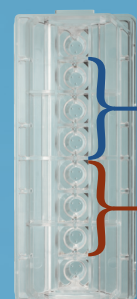
Select from built-in  
assay templates or  
create your own.

**Wave**

Compatible with  
Wave. Enables  
in-depth  
data analysis.



XFp Miniplate  
designed for pairwise  
comparisons.



Single use aliquoted  
reagents for rapid  
XF Stress Test setup.





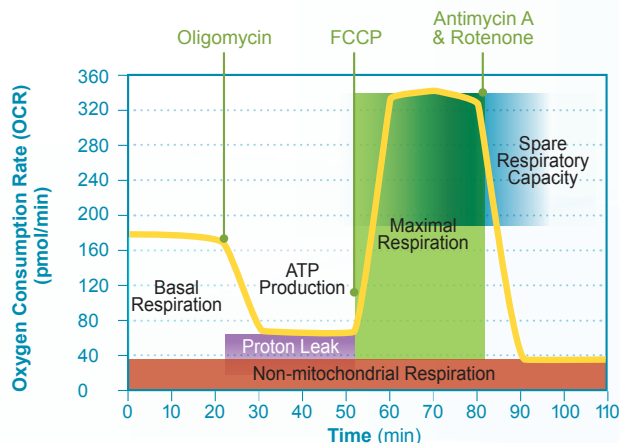
# METABOLISM MATTERS

The role of energy metabolism in a wide variety of cellular and physiological processes, from cardiovascular function to the immune response, is well established. Many diseases are now being traced back to metabolic dysfunction or reprogramming. In order to paint a complete picture of cellular and disease systems, functional metabolic data is needed. Extracellular Flux (XF) technology makes it possible for scientists to generate and interpret metabolic data without the need for expertise in metabolism.

## Seahorse XF Assays Are the Standard for Functional Metabolic Measurements

### XF Cell Mito Stress Test Profile

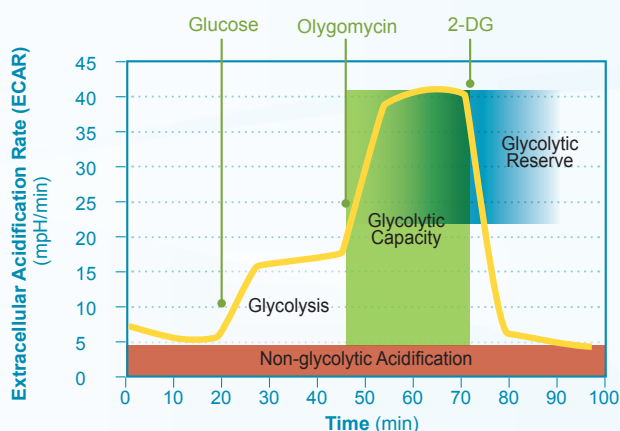
Mitochondrial Respiration



The XF Cell Mito Stress Test Profile depicts a complete mitochondrial respiration profile that reveals the key parameters of mitochondrial function: basal respiration, ATP production, proton leak, maximal respiration, and spare respiratory capacity.

### XF Glycolysis Stress Test Profile

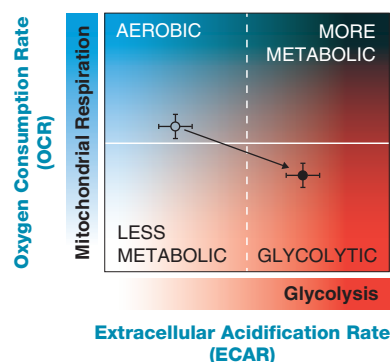
Glycolytic Function



The XF Glycolysis Stress Test Profile depicts the three key parameters of glycolytic function: glycolysis, glycolytic capacity, and glycolytic reserve, revealing information not evident in endpoint measurements such as lactate or ATP production alone.

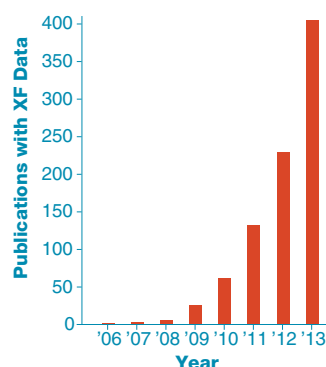
### XF PhenoGram Profile

XF Metabolic Switching



The XF PhenoGram depicts the relative metabolic state of cells under two conditions. Examples of metabolic switching include the Warburg Effect, Crabtree Effect, and Pasteur Effect.

### Innovative and Proven XF Technology

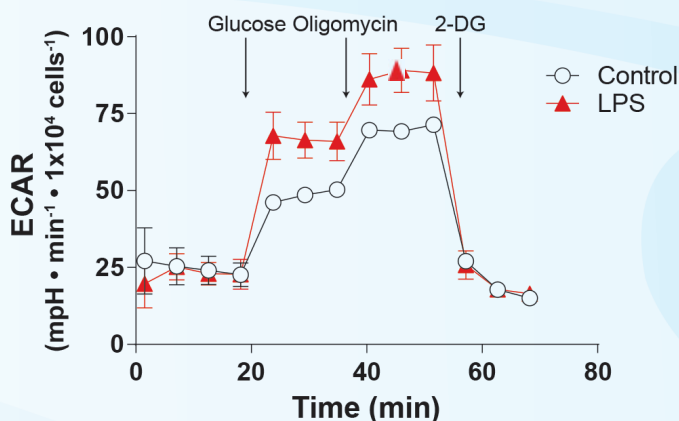


There are over 1,000 references to XF technology published in leading scientific journals. Scientists worldwide are embracing the award-winning XF technology to identify metabolic phenotypes and reprogramming to determine how this could be used to target metabolic changes for therapeutic purposes.

# GET THE DATA YOU NEED TO TELL A COMPLETE STORY

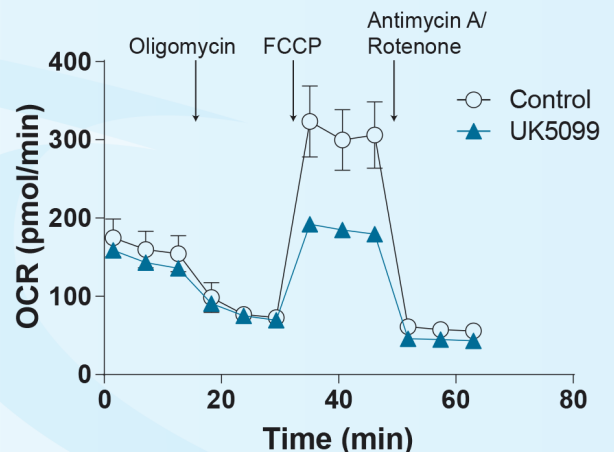
The XFp Extracellular Flux Analyzer is built on innovative and proven XF technology for live cell-based assays of energy metabolism. Compact and easy to use, the XFp Analyzer is designed to perform standard XF assays, and is ideal for pairwise comparisons. The transient microchamber format is highly sensitive, allowing detection of extracellular flux in patient-derived and other precious sample types. This streamlined platform delivers functional metabolic data at a fraction of the cost and time compared to larger scale instrumentation, so is suitable for single-lab ownership.

## Analyze metabolic reprogramming in primary immune cells



In order to respond to foreign antigens, immune cells must be able to increase their metabolism. Macrophages rely on glucose to fuel a robust response. In these mouse bone-marrow derived macrophages, overnight activation by bacterial lipopolysaccharide (LPS) revved up the glycolytic machinery. In a single XF Glycolysis Stress Test, the XFp detected an increase in both glycolysis (measured by extracellular acidification rate, ECAR) and glycolytic reserve compared to quiescent cells.

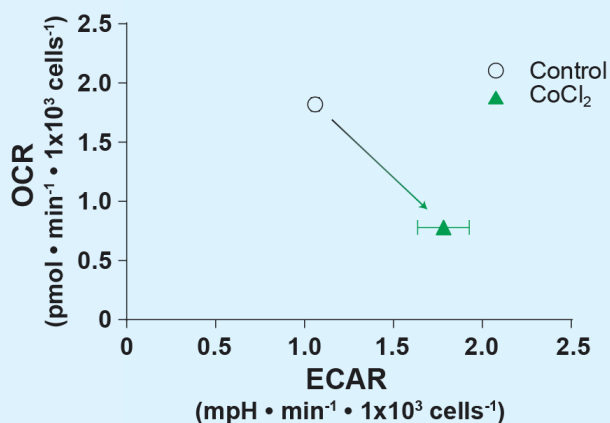
## Verify the impact of disease-linked genes on metabolic phenotype



Oxidative phosphorylation (OXPHOS) requires the mitochondrial electron transport chain as well as access to appropriate substrates such as pyruvate. An XF Cell Mitochondrial Stress Test performed on an XFp shows that basal OXPHOS (measured by oxygen consumption rate, OCR) is maintained but spare respiratory capacity is abrogated by inhibition of mitochondrial pyruvate carrier 1 (MPC1) in these C2C12-derived myotubes. A 90-minute pre-treatment with UK5099, an inhibitor of MPC1, mimics the effect of impaired MPC-1 function on the metabolic phenotype.



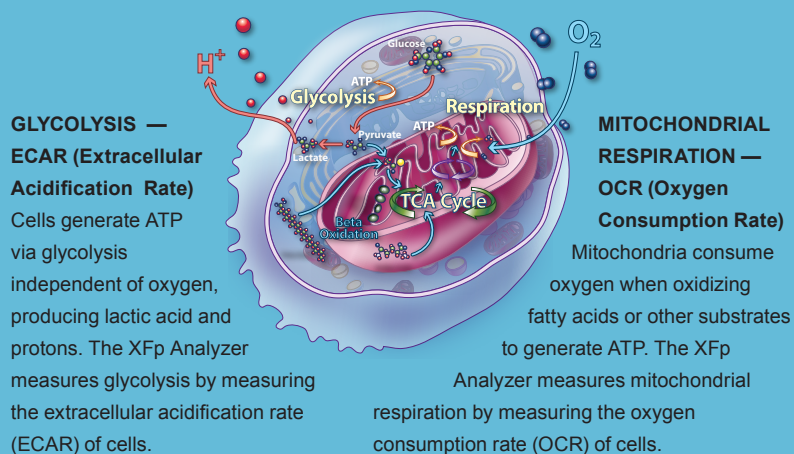
## Detect metabolic switching in a single pairwise experiment



Upon induction of certain signaling pathways, cells will shift their mode of energy production from OXPHOS towards glycolysis. Activation of the HIF-1 $\alpha$  pathway by cobalt chloride induces such a metabolic switch in human ovarian cancer cells (SKOV-3). The pairwise comparison shown in this XF Phenogram clearly illustrates the Warburg effect, in which OXPHOS (measured by OCR) of the treated cells is reduced even in the presence of oxygen, and is accompanied by an increase in glycolysis (measured by ECAR) relative to the control.

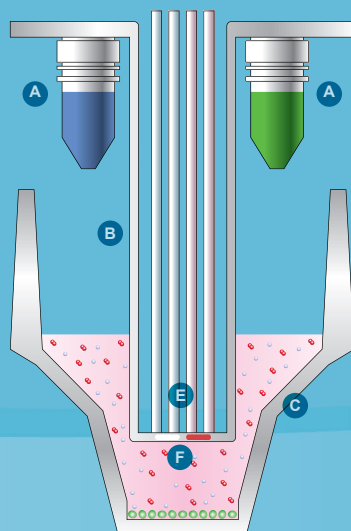
## How XF Technology Works

The XFp Analyzer simultaneously measures the two major energy pathways of the cell - mitochondrial respiration and glycolysis — in live cells using label-free, solid-state sensor cartridges in a miniplate format. The XFp Analyzer works with most cell types, including primary cells, adherent cell lines, and suspension cells.



## THE PATENTED MICROCHAMBER MAKES IT ALL POSSIBLE

The XFp Analyzer utilizes patented transient microchambers which enable sensitive, precise, and nondestructive metabolic measurements in minutes.



Cutaway graphic of a single probe and wall

- A** Integrated injection delivery ports sequentially deliver up to 4 compounds allowing dose response, agonist or antagonist response, or pathway perturbation analysis of each sample.
- B** Sensor probes gently lower to create a Transient Microchamber, allowing rapid, real-time measurement of changes in both oxygen and proton concentrations in the cell medium.
- C** Chamber wall is designed to eliminate cell shear.
- D** XFp Miniplates support virtually all cell types.
- E** Inert optical micro sensors measure rates of oxygen consumption and extracellular acidification simultaneously.
- F** 200  $\mu$ L well requires a small number of cells. 10-20 fold fewer cells compared to conventional respirometers.



# THE WORLD'S MOST ADVANCED METABOLIC ANALYZER

Cancer  
Cardiovascular Disease  
Cell Physiology  
Immunology  
Neurodegeneration  
Obesity/Diabetes  
Stem Cell Biology  
Toxicology  
Translational Medicine

## Specifications

<b>Dimensions</b>	43.0cm H x 30.3cm W x 56.8cm D (16.9" H x 11.9" W x 22.4" D)
<b>Weight</b>	14.7 kg (32.5 lb)
<b>Power Requirements</b>	100-120/200-240VAC 6A/3A; 50/60Hz
<b>Measurements</b>	OCR & ECAR
<b>Assay Format</b>	Live cells in a miniplate
<b>Number of Wells</b>	6 assay wells
<b>Injection Ports</b>	4 per well, 25 $\mu$ L each
<b>Assay Running Volume</b>	80-200 $\mu$ L/well
<b>Sample Requirements</b>	10K-500K cells/well
<b>Plate Material</b>	Tissue-culture treated polystyrene
<b>Instrument Controller</b>	Integrated full-color touch-screen interface; network-capable; e-mail support; USB port.
<b>Analysis Software</b>	Wave. For use on a Windows laptop or desktop computer.

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