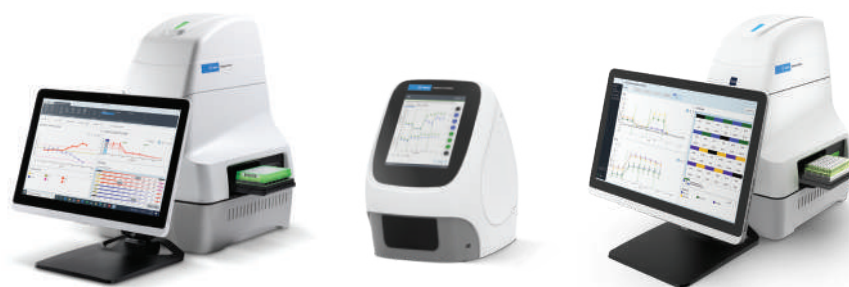


Discover the Drivers of Cell Fate, Function, and Fitness

Agilent Seahorse XF analysis platform





Are You Measuring What's *Really* Important to Your Cells?

To fully understand what drives cell phenotype and function, you must consider the influences of energy metabolism.

Examining energy metabolism has led to new insights into biological function. In fact, some of the decade's most significant discoveries have hinged upon elucidating the role of energy metabolism in cellular processes.

Live-cell, functional metabolic data is impacting therapeutic research and discovery in areas like these:

Immunology

- Uncover the drivers behind cell fate and determining metabolic fitness of immune cells
- Monitor and modulate immune cell activation in real time
- Target metabolic pathways to improve immunotherapy design and performance

Cancer

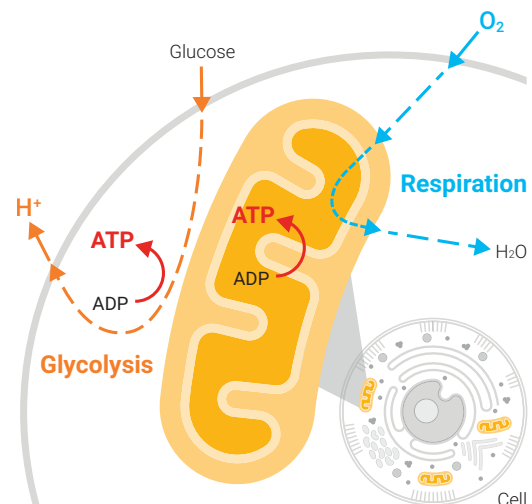
- Study how cancer cells rewire metabolic programs to support rapid growth
- Investigate which nutrients fuel cancer cells
- Reveal how tumor microenvironment shapes metabolism

Neurodegeneration and aging

- Identify metabolic abnormalities in the diseases
- Boost energy metabolism to restore neural function
- Modulate metabolism in neuronal stem cell to improve function

Stem cell biology and regenerative medicine

- Uncover the energy metabolic programs that drive stem cell fate
- Optimize medium conditions to achieve desired phenotype



Obesity, diabetes, and metabolic disorders

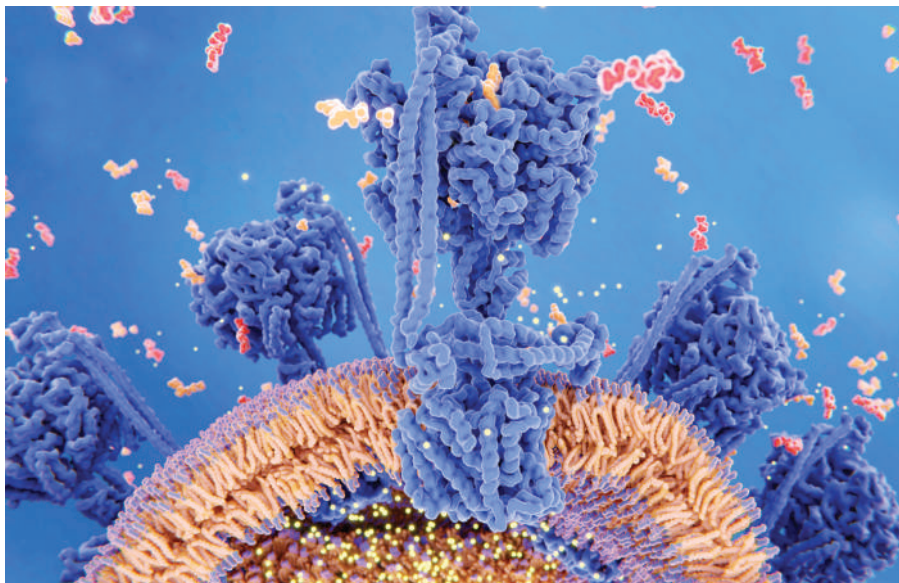
- Examine mitochondrial health, nutrient use, fatty acid oxidation, and glycolysis in healthy and diseased models
- Confirm functional outcomes from genetic mutations in metabolic pathways

Toxicology

- Detect mitochondrial liabilities among potential therapeutics
- Assess the risk of mitochondrial toxicity in vitro with high specificity and sensitivity
- Determine the mechanism of action of mitochondrial toxicants

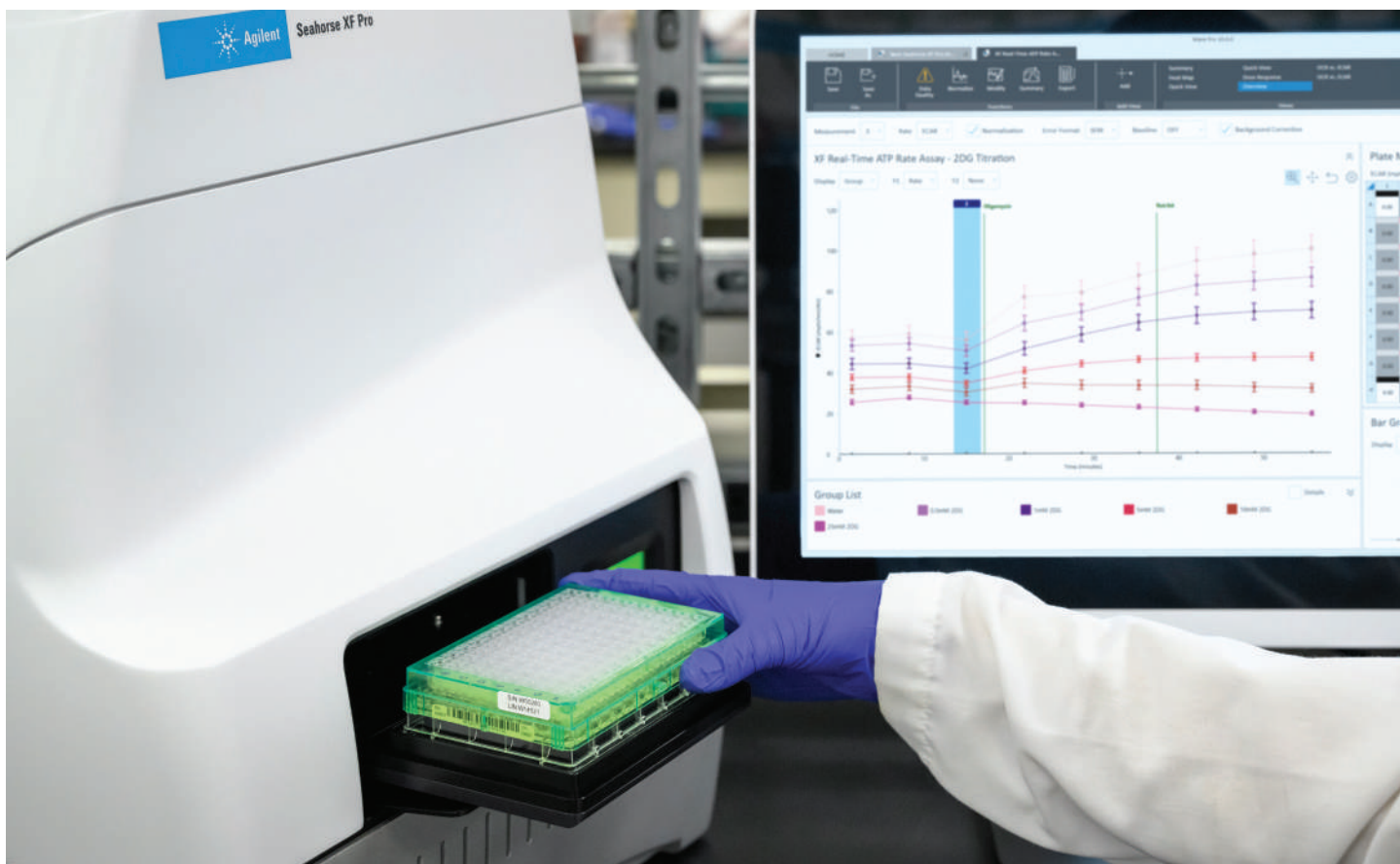
Complete platform for live-cell metabolic assays

Comprising instruments, assay kits, software, and consumables, Agilent Seahorse XF platforms are designed to support you from sample to insight.



Move beyond analyzing what your cells are and get a clear picture of what they do

- Instrumentation for real-time extracellular flux (XF) measurements in live cells
- Optimized kits, media, and reagents for standardized XF assays
- Proprietary sensors, plastics, and consumables for reliable XF data
- Powerful analytics to help interpret and share your results



Seahorse XF analyzers: The standard for measuring energy metabolism in live cells

Agilent Seahorse XF analyzers enable robust measurements of mitochondrial activity, glycolysis, and ATP production rates in a microplate format.

- Label-free detection of discrete bioenergetic changes in live cells, in real time
- Multiple parameters reported from every assay well, including oxygen consumption and proton efflux rates, and ATP production rates
- Compatibility with a wide range of 2D and 3D biomaterials, including adherent and suspension cells, tissue, organoids, spheroids, small organisms, and isolated mitochondria
- Four-port injection system with automated mixing feature for assessing immediate cellular responses to substrates, inhibitors, and other compounds
- Transient microchamber provides superior sensitivity and signal-to-noise ratio



Seahorse XF Pro analyzer

Maximize your capacity for XF assays and minimize cost per sample with high sensitivity and consistent measurements. The Agilent Seahorse XF Pro analyzer (96-well format) enables many experimental groups per assay, maximizing design flexibility and sample throughput. It comes with state-of-the-art software and streamlined workflows that will greatly enhance user experience.

Key research applications:

- Phenotypic screening
- Testing many conditions at one time
- Dose-response studies
- OMICS functional confirmation
- Spheroids



Seahorse XF HS Mini analyzer

High-sensitivity capabilities combined with an easy-to-use interface make the 8-well Agilent Seahorse XF HS Mini analyzer accessible for every lab while delivering robust XF analysis on limited cell numbers. It also allows you to use fewer cells per well compared to other XF platforms.

Key research applications:

- Optimization of experimental conditions before scaling up
- Rare, sorted, or primary immune cells
- Quiescent and low-respiring cell types
- Cell lines and ex vivo samples



Seahorse XF Flex analyzer

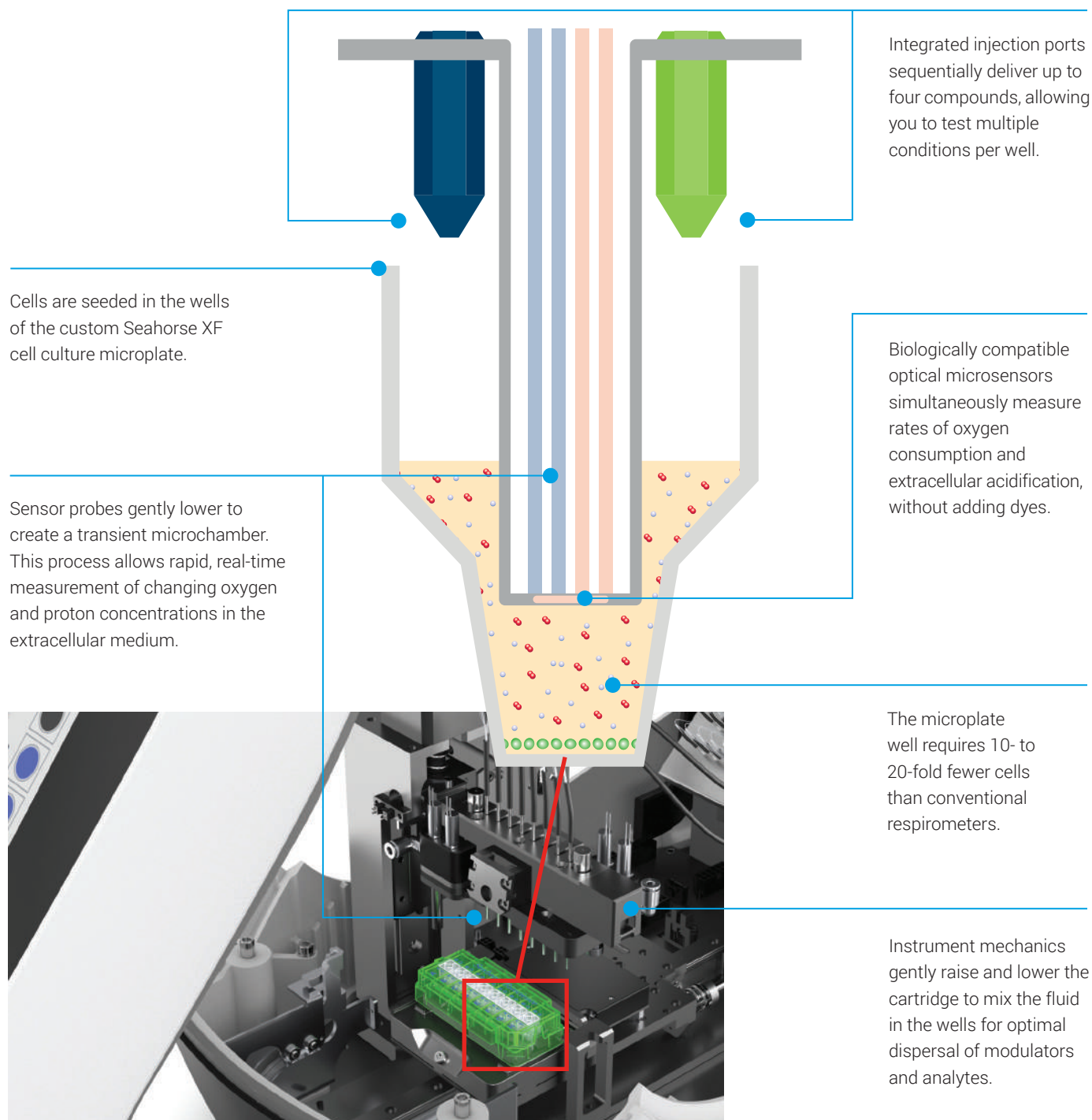
The Agilent Seahorse XF Flex analyzer is a versatile system that expands real-time metabolic analysis beyond 2D cell cultures, empowering physiologically relevant discoveries with 3D models.

Key research applications:

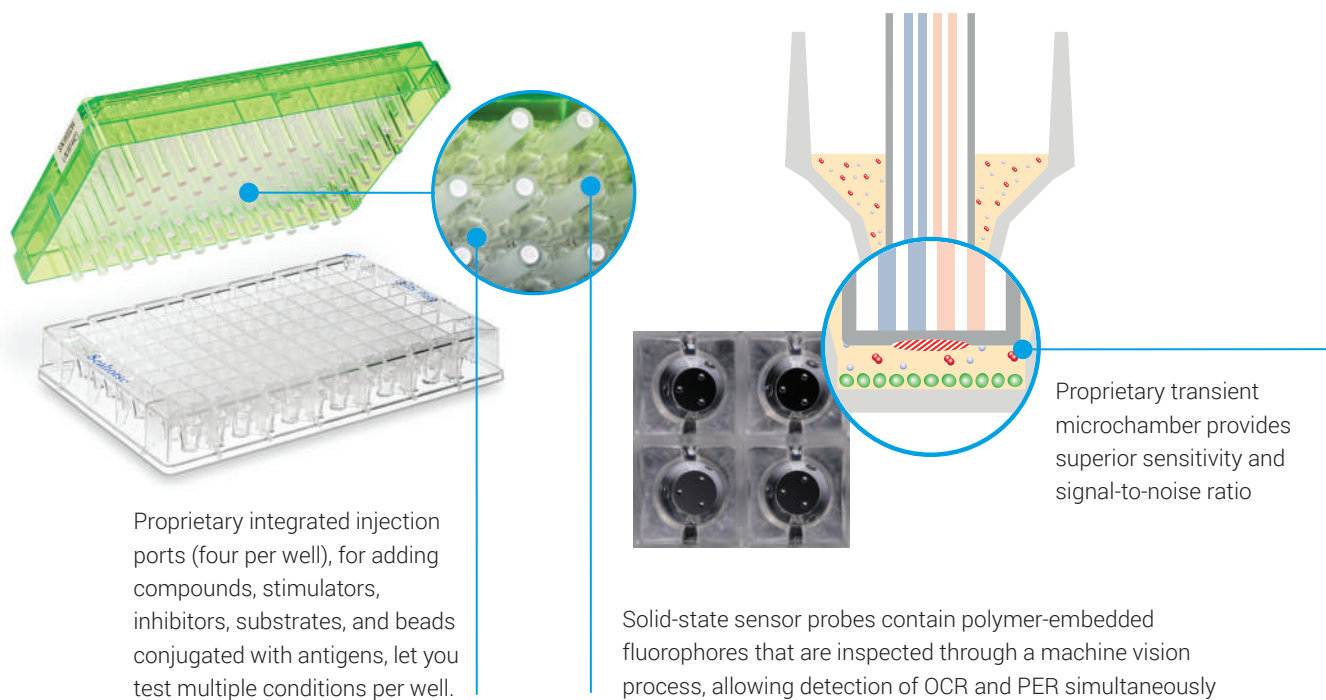
- Tissue
- Organoids
- Islets
- Small organisms
- High-respiring cells

Take a closer look at Seahorse XF technology

The proprietary Seahorse XF platform lets you measure both metabolic energy pathways simultaneously with speed and precision.



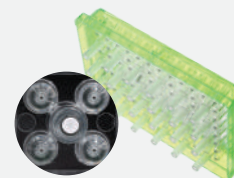
Smart plastic technology makes it all possible



Quality XF sensor cartridges and cell plates are integral to the Seahorse XF measurement system

XF sensor cartridges: Essential to sensitive, simultaneous measurement of bioenergetic pathways

- Noninvasive sensors measure dissolved oxygen and free protons.
- Built-in injection ports deliver compounds at preprogrammed intervals.
- Precision manufacturing process ensures consistent lot-to-lot performance.

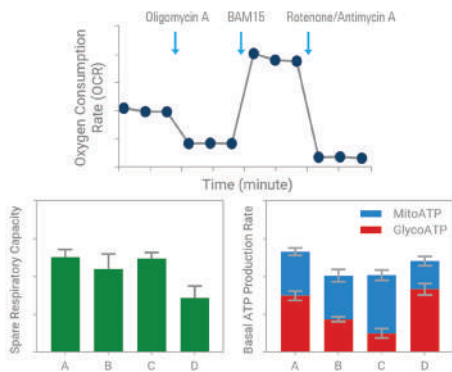


XF cell culture microplates: Specific to application and instrument type

- Plates are tissue-culture treated and irradiated for cell culture operations.
- Unique well geometry enables rapid, sensitive XF measurements.
- Adheres to SBS standards for plate reader compatibility.
- Poly-D-lysine coated plates ensure more consistent suspension cell workflows.
- XF HS miniplate accommodates fewer cells per well when sample amount is limited.



Customized assays for cell therapeutics development



Seahorse XF T Cell Metabolic Profiling assays

(kit part number 103772-100)

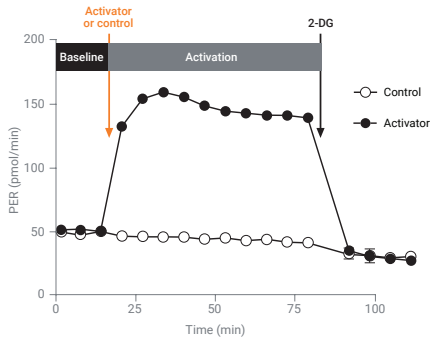
With optimized reagents for different T cell populations, these Agilent Seahorse XF T Cell Metabolic Profiling assays provide robust bioenergetic parameters linked to two critical attributes for antitumor properties: T cell persistence and T cell metabolic fitness.

- Suitable for evaluation of construct design, engineering strategies, starting material selection, or metabolic conditioning during in vitro cell expansion
- Applicable for use in assessing the capacity of T cells to maintain metabolic fitness in tumor microenvironments
- Can be used for NK cell metabolic profiling

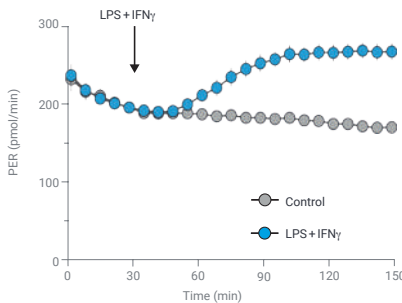
Immune-cell activation assays for general research applications

Detect activation responses in minutes upon stimulation, providing an early window for studying immune cell activation, modulation, and related metabolic reprogramming.

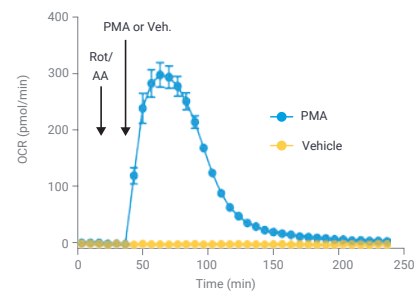
Seahorse XF Hu T Cell activation assay (part number 103759-100)



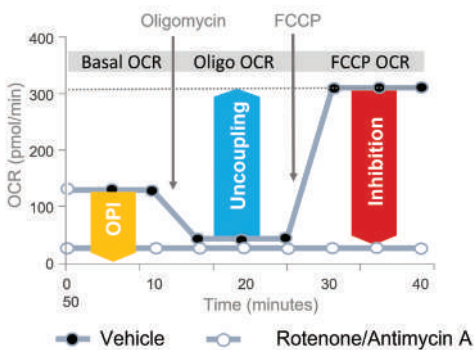
Macrophage activation assay



Neutrophil activation assay



Turnkey solution for preclinical safety studies

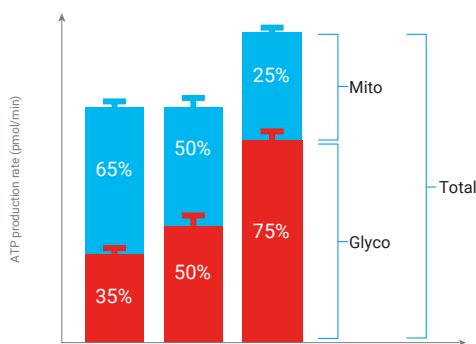


Seahorse XF Mito Tox assay (kit part number 103595-100)

The Agilent Seahorse XF Mito Tox assay solution integrates the XF Pro analyzer, a streamlined workflow, and enhanced software tools, enabling you to easily identify drug-induced mitochondrial toxicity.

- A direct functional assay to provide high sensitivity and specificity
- Simplified assay design with quantitative and binary MTI parameters to quickly identify the type and magnitude of mitochondrial toxicity
- Enhanced software tools to deliver an end-to-end solution that reduces your time to conclusion

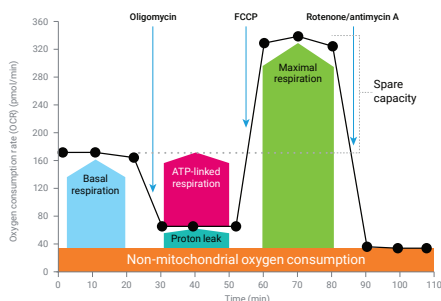
Core assays for therapeutic discovery and research



XF Real-Time ATP Rate assay (kit part number 103592-100)

This quantitative method measures the production rates of ATP from mitochondrial respiration and glycolysis simultaneously in live cells. It can be used to:

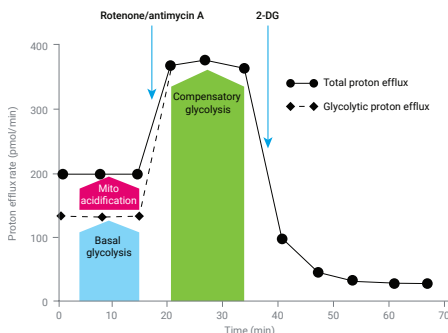
- Assess metabolic phenotype changes during cell activation, proliferation, and differentiation.
- Identify pathway liabilities.
- Screen for compound effect on cellular ATP production.



XF Cell Mito Stress Test (kit part number 103015-100)

This widely recognized test can provide a comprehensive understanding of mitochondrial (dys)function. It can be used to:

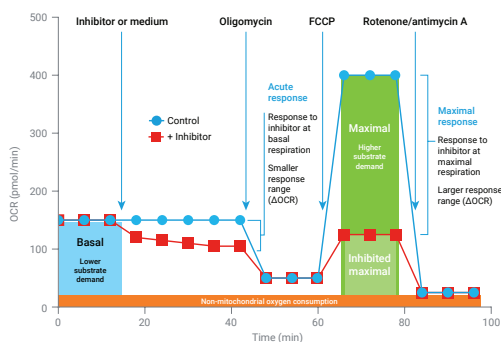
- Report on multiple parameters—including basal and ATP-linked respiration, maximal and spare respiratory capacity, and proton leak.
- Investigate functional differences between cell types and the impact of genetic or pharmaceutical interventions.



XF Glycolytic Rate assay (kit part number 103344-100)

This assay can accurately measure glycolysis in live cells by quantifying proton efflux rate (PER) specific to glycolysis. It can be used to:

- Detect transient and rapid metabolic switches (such as the Warburg effect) in minutes.
- Measure the effects of metabolic modulators on glycolytic rates.
- Report on multiple key parameters: basal and compensatory glycolysis.



XF Substrate Oxidation Stress Tests

(kit part numbers 103572-100, 103573-100, and 103574-100)

With these optimized kits, you can dive deeper to study the impact of three primary substrates on mitochondrial and cellular function. They can be used to:

- Explore which substrates are relevant or required for a specific cellular function or phenotype.
- Discover how cell phenotype can be controlled via manipulation of substrate oxidation activities.

3D model applications

Enabled by dedicated consumables, the XF Flex analyzer can work with diverse 3D biological samples, offering multifaceted, physiologically relevant approaches to studying cellular metabolism.

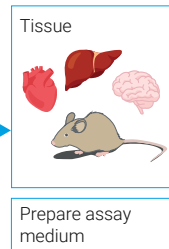
Seahorse XF Flex 3D Capture Microplate-L and tissue workflow

Day before

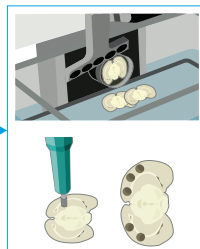
Preparation

Hydrate cartridge and prewarm plate
Prepare tissue slicing medium (chill overnight)
Prepare assay template

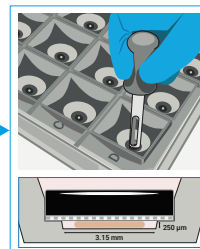
Dissect tissue of interest



Prepare tissue slice and punch



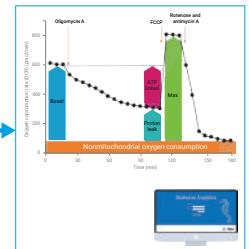
Deliver tissue punch to well and place capture ring



Prepare compounds and perform assay



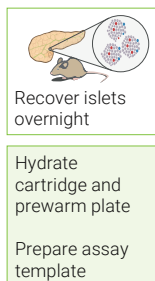
Analyze data and normalization



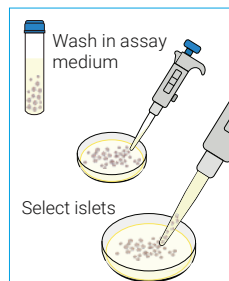
Seahorse XF Flex 3D Capture Microplate-S and islet/spheroid workflow

Day before

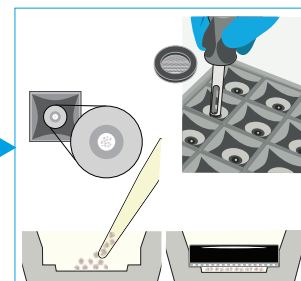
Isolate islets and prepare plates



Prepare medium and collect islets



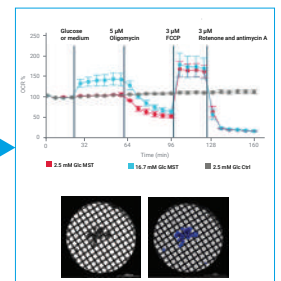
Deliver islets to well and install capture ring



Prepare compounds and perform assay



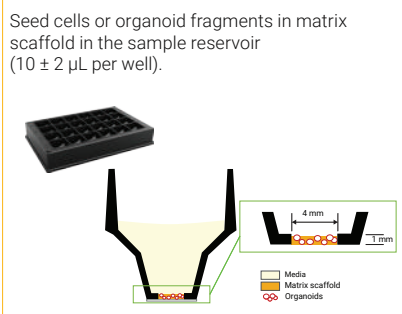
Analyze data and normalization



Seahorse XF Flex organoid microplate and organoid workflow

Days before assay

Prepare organoid cultures in XF Flex organoid microplate



Day before assay

Deliver islets to well and install capture ring

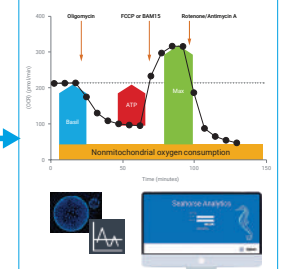


Day of assay

Prepare compounds and perform assay



Analyze data and normalization



Enhance data quality and transform data into insights

Integrate imaging and normalization into your Seahorse XF analysis for more consistent and interpretable results

Agilent BioTek Cytation platforms are automated digital imaging systems that can be seamlessly integrated into XF assay workflow when interfaced to a single XF controller software. These systems allow users to:

- Easily normalize signal by cell count to compare across treatment groups.
- Examine cell culture integrity/health before and after XF assays.
- Improve data quality and interpretability.



Experience intuitive, streamlined experimental setup and data analysis

Agilent Seahorse Wave Pro controller software, created for the XF Pro analyzer, includes preloaded templates, advanced template import features, and dose-response assay setup for quick design of experiments.

Web-based Agilent Seahorse Analytics offers exclusive cutting-edge data analysis features (such as multiframe analysis, hit identification, dose-response curves, and Z-prime) allowing for customizable analysis views and reports that can turn data to insights quickly. It also provides secure data storage. Data can be exported into third-party graphing and statistical software like GraphPad Prism and Microsoft Excel.



Turn raw metabolic data into publishable results

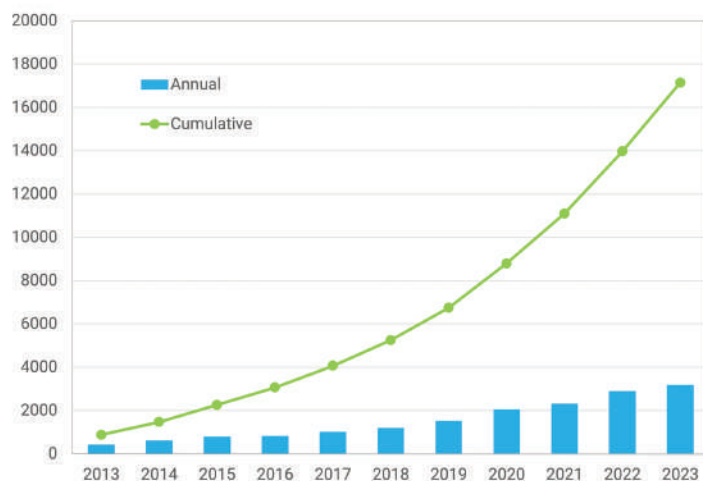
Seahorse Analytics, the next generation of XF data analysis, provides secure data storage and intuitive data analytics in the cloud. Features include:

- Desktop-like interactivity for accessibility from anywhere on both PC and Mac
- Built-in formulas for automatic calculations and summaries of Seahorse XF assay parameters
- Customizable analysis views for turning data to insight— or for easy data sharing
- Flexible tools for easily exporting your data into third-party graphing and statistical software applications, such as GraphPad Prism and Microsoft Excel

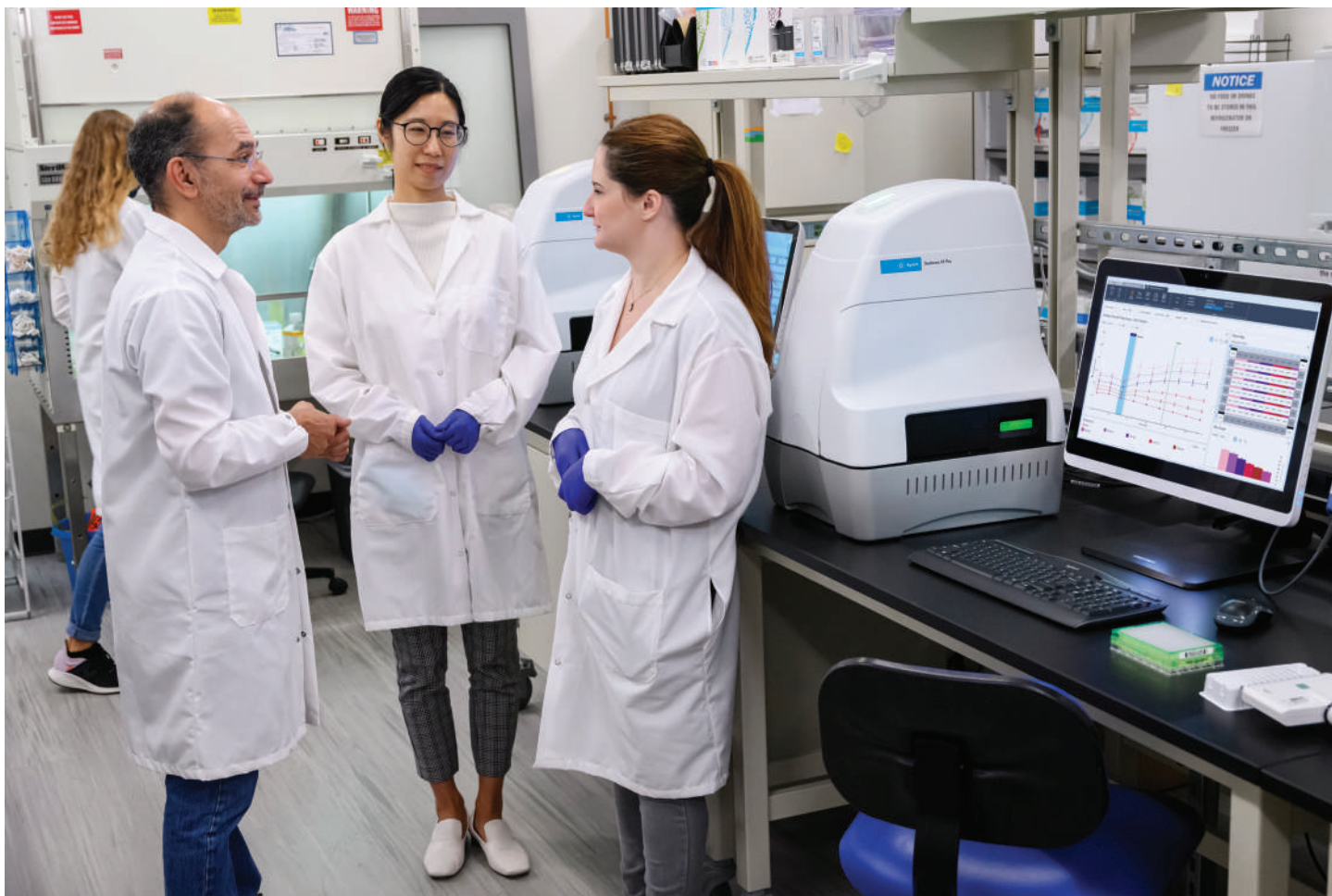


Did you know that having papers with functional data improves your chances of getting published in a top-tier journal?

Observing intact cell behavior in real time provides much-needed context and confirmation of omics data. No wonder it's playing a growing role in peer-reviewed literature.



Over 17,000 publications to date. [Agilent cell analysis publications](#) (through 2023).



Discover how XF Pro technology can advance your drug discovery studies

Dysfunctional metabolism is associated with many different disease states and is a rich source for bolstering target discovery programs. By incorporating live-cell metabolic measurements, early drug discovery scientists are gaining deeper understanding of therapeutic target effects and the impact of therapeutic agents to alleviate disease states.



Provide cellular attributes linked to antitumor potential of T cell therapeutic products



Identify novel drug targets



Verify target effect on cell function



Determine drug safety



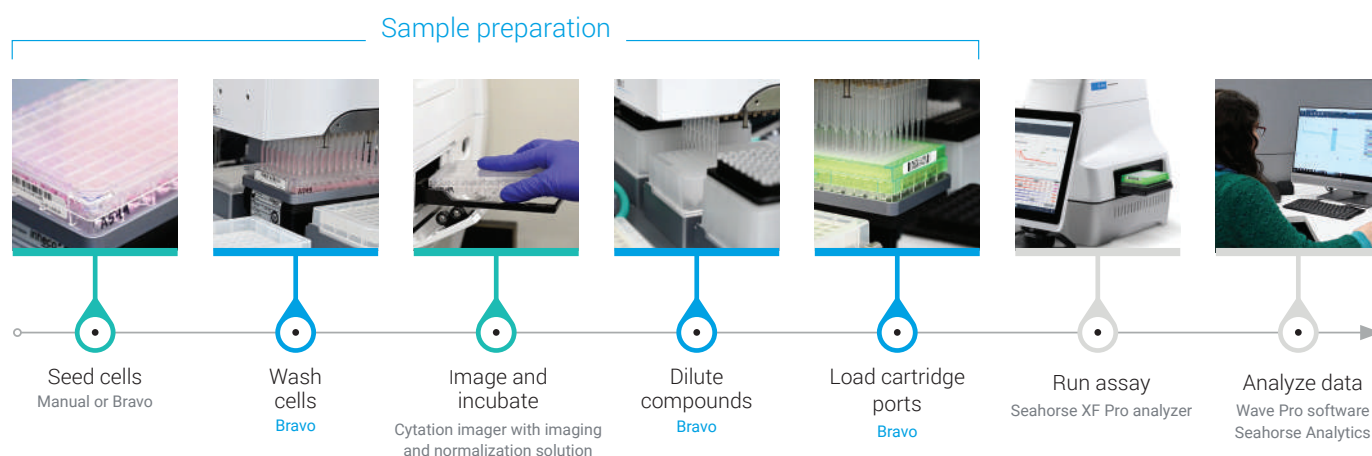
Confirm function post genetic modification



Characterize in vitro disease model

Complete Your Workflow—and Advance Your Live-Cell Metabolic Analysis

Agilent offers a complete workflow for live-cell metabolic analysis, including cell metabolism analyzers, liquid handling automation, imaging plate readers, and high-quality consumables. All work together to help you achieve consistent, reproducible data.



Consistent data starts with consistent sample preparation

Getting reliable data from live cell-based assays can be challenging if your assay preparation methods are not reliable. Automated sample preparation can maximize productivity and minimize human error.

The Agilent Bravo Seahorse Assay Workbench allows users of all experience levels to:

- Standardize sample preparation. Intuitive software ensures consistent results between users.
- Increase walk-away time, improve the efficiency of your lab personnel.
- Minimize variability, generating consistent data no matter who is running the protocol.



Agilent Value Promise

We guarantee you at least 10 years of instrument use from your date of purchase. Otherwise, we will credit you with the residual value of the system toward an upgraded model.

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