

# Choosing the Right Technologies to Assess Cell Health for Drug Research

## What is cell health?

Understanding the physiological state, or health, of your cells is the first step toward experimental success. Cell stress, apoptosis, necrosis, autophagy, and metabolic changes are a few of the commonly studied states of cell health. New methods are providing deeper insights into cell health and enabling development of safer and more effective drugs.

From simple assays for evaluating cell viability to automated multiparametric 3D cell models, how do you choose the right technologies to meet your goals?

Cell Viability

Fluorescent Detection

Cell Imaging

Cell Count

Impedance-Based Biosensor

Metabolic Assessment

Bioenergetic Profile



### Insights

	BioTek Synergy Multimode Microplate Reader	xCELLigence RTCA**	xCELLigence RTCA** eSight	BioTek Cytation Imaging Multimode Reader	Novocyte Flow Cytometers	Seahorse XF Analyzers
Cell Viability	✓	✓	✓	✓	✓	
Fluorescent Detection	✓		✓	✓	✓	
Cell Imaging			✓	✓		
Cell Count			✓	✓	✓	
Impedance-Based Biosensor		✓	✓			
Metabolic Assessment	✓		✓	✓	✓	✓
Bioenergetic Profile						✓

### Workflow Advantages

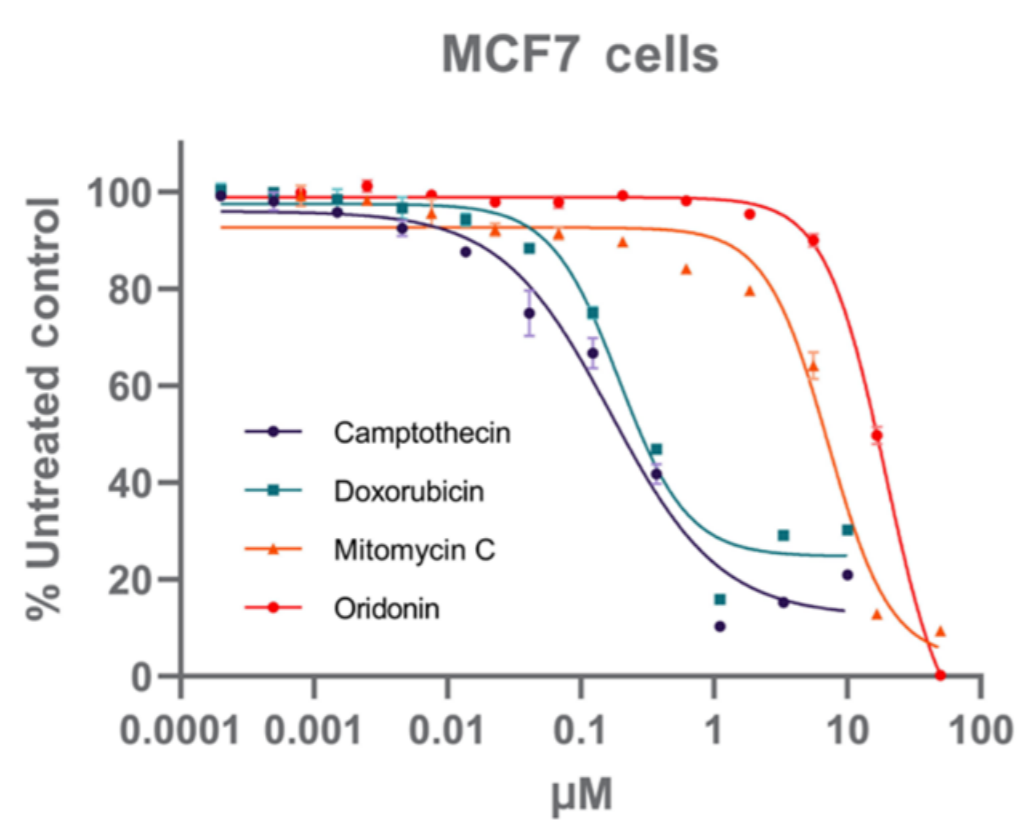
Real-Time	✓	✓	✓	✓		✓
Label-Free		✓	✓	✓		✓
High-Throughput	✓	✓	✓	✓	✓	✓
3D Cell Models			✓	✓		✓
Compliance Enabled Software	✓	✓	*	✓	✓	*

\*Compliance enabled software in development

\*\*Real Time Cell Analyzer

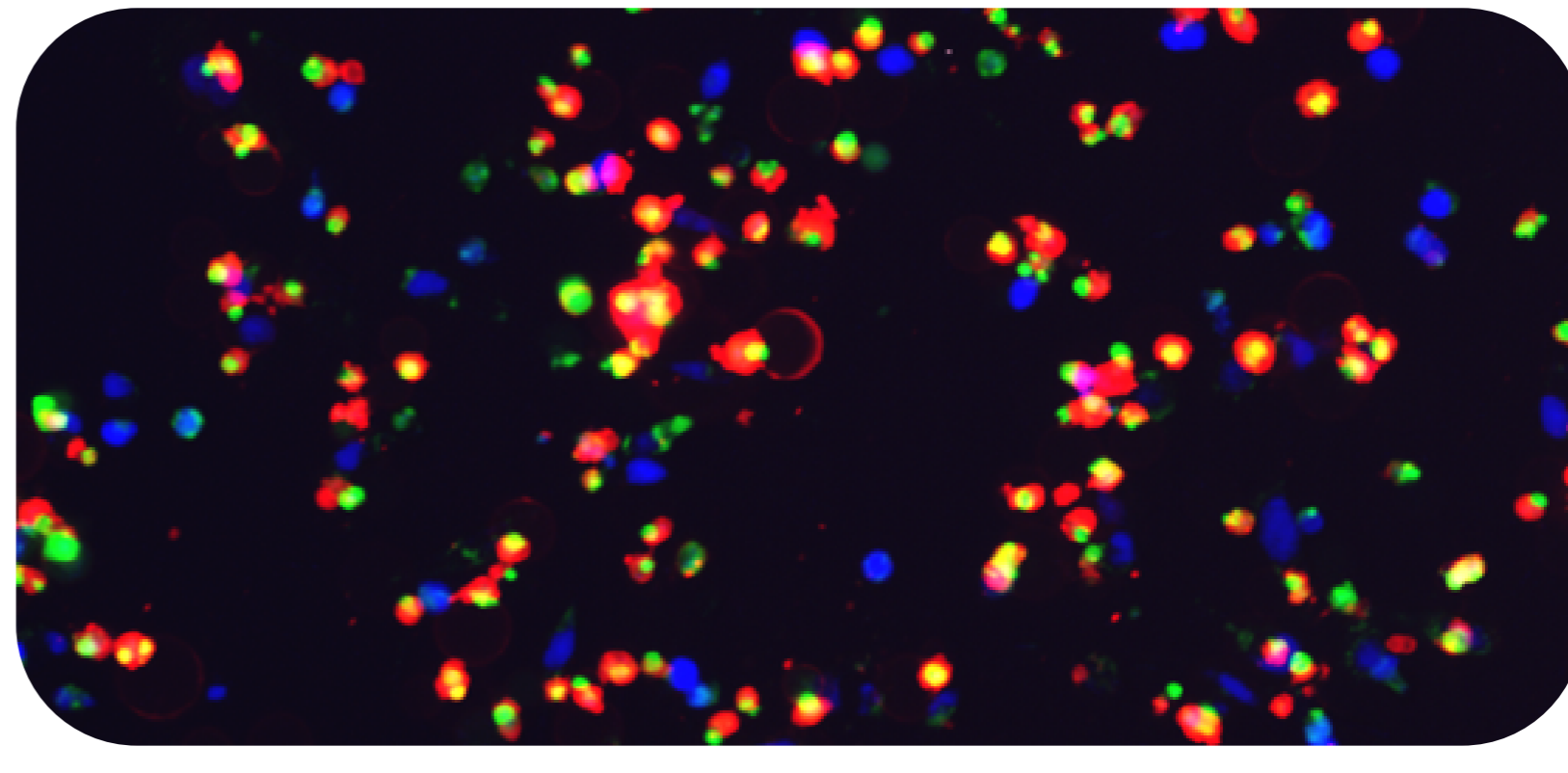
## Cell Viability

Accurately measuring cell viability—the proportion of healthy living cells in a population—is an important contributor to reproducibility in cell-based assays.



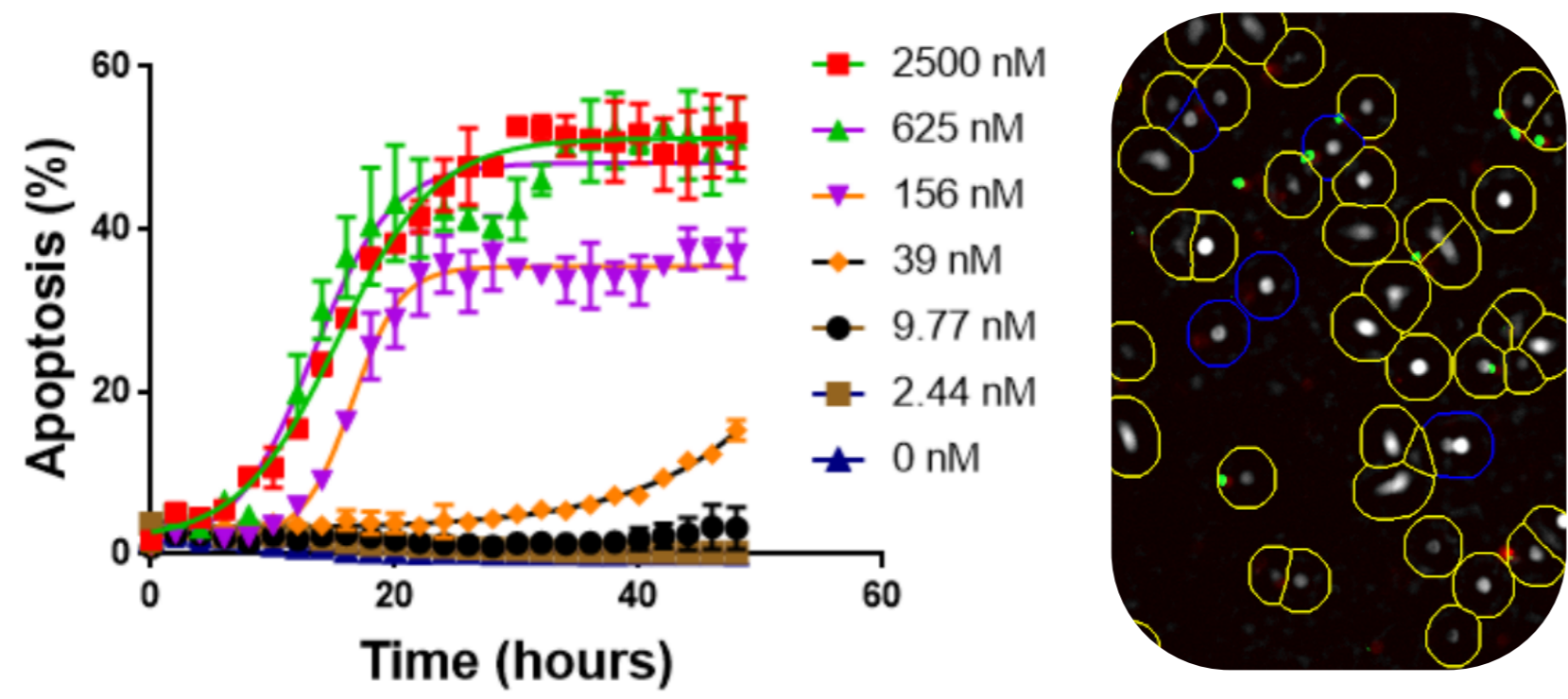
## Fluorescent Detection

Explore biological and temporal context of the state of cell health. Deeper investigation using fluorescence detection can elucidate specific processes or cell death pathways.



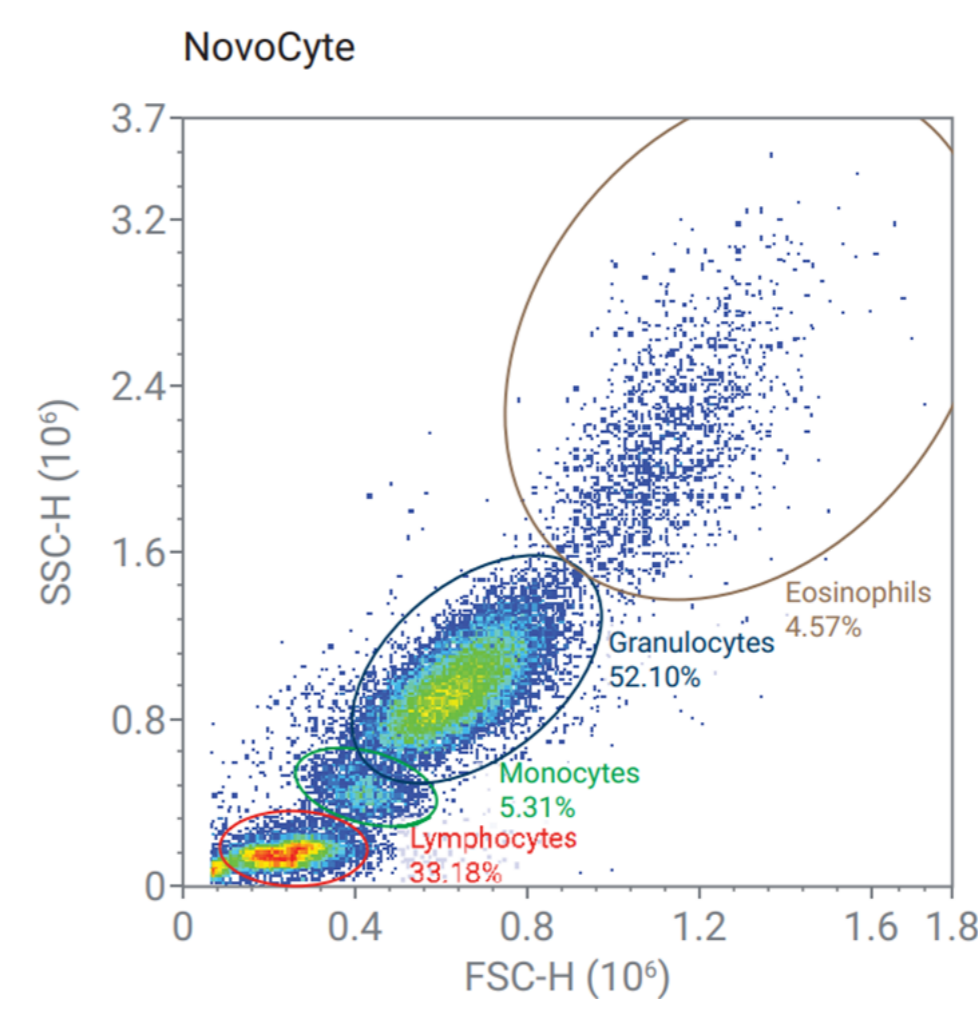
## Cell Imaging

Imaging enables a visual confirmation of additional parameters, including morphology. Image analysis can also provide quantitative assessment of different cell classifications.



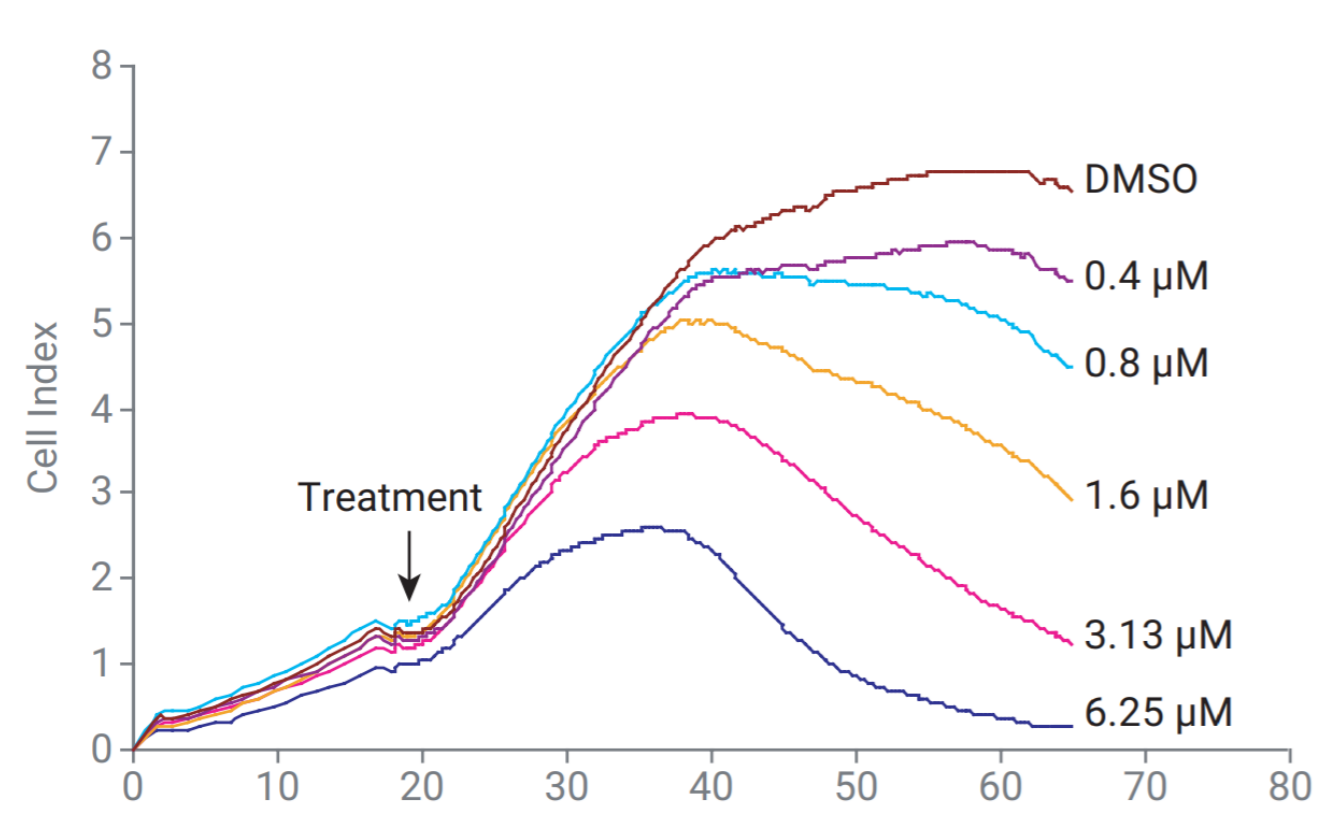
## Cell Count

Quantitative endpoint measurements of viability assays are typically single parameter and can either be homogenous (representing the whole sample) or provide single-cell resolution with cell count. Proportions of different cell types can be determined with the use of fluorescent markers.



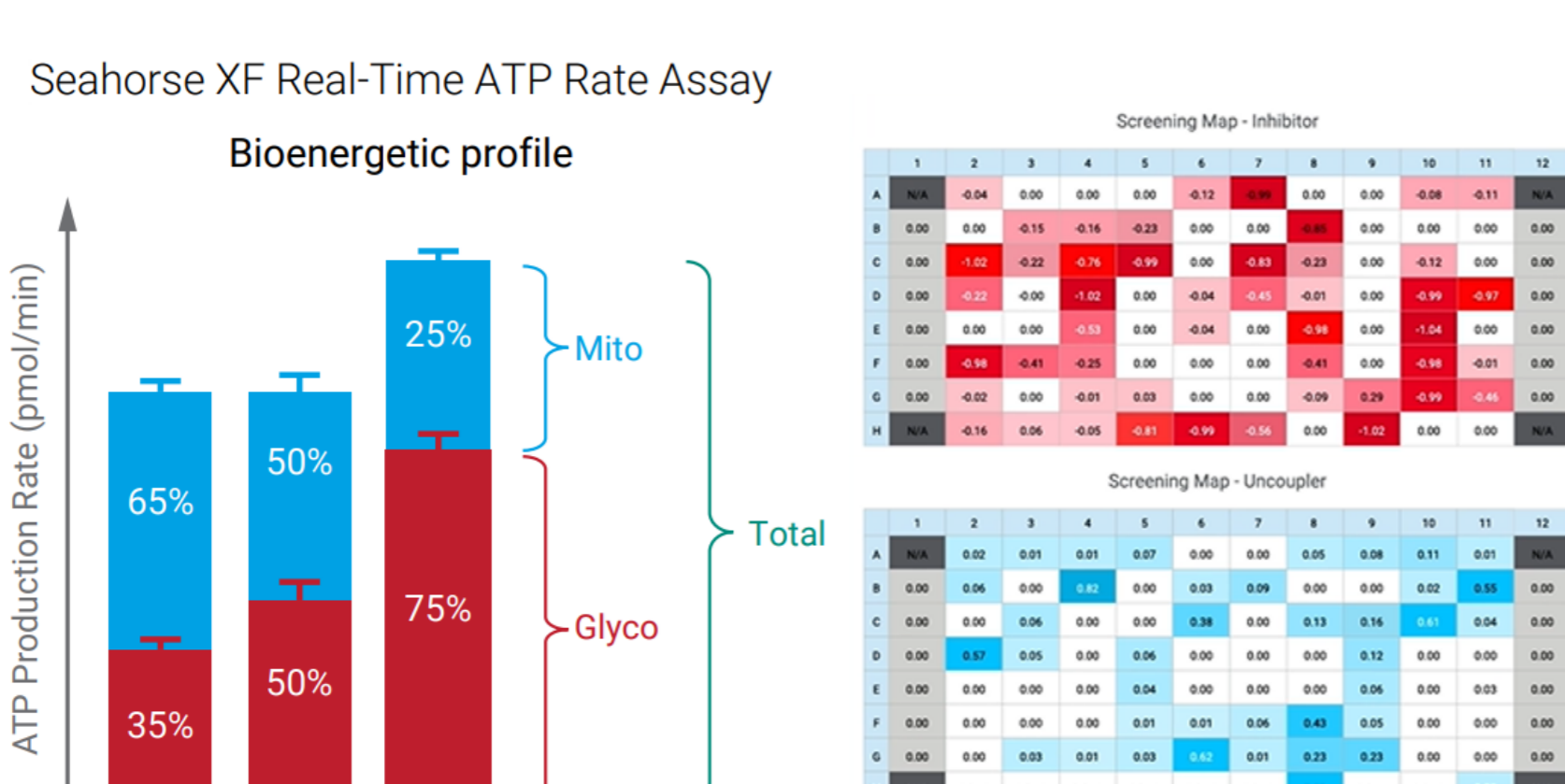
## Impedance-Based Biosensor

Monitoring live changes in cellular impedance provides readouts based on physical properties of the cell, enabling rapid measurement of changes to cell health. Impedance—a novel biosensor-driven metric—enables high temporal resolution of cell health.



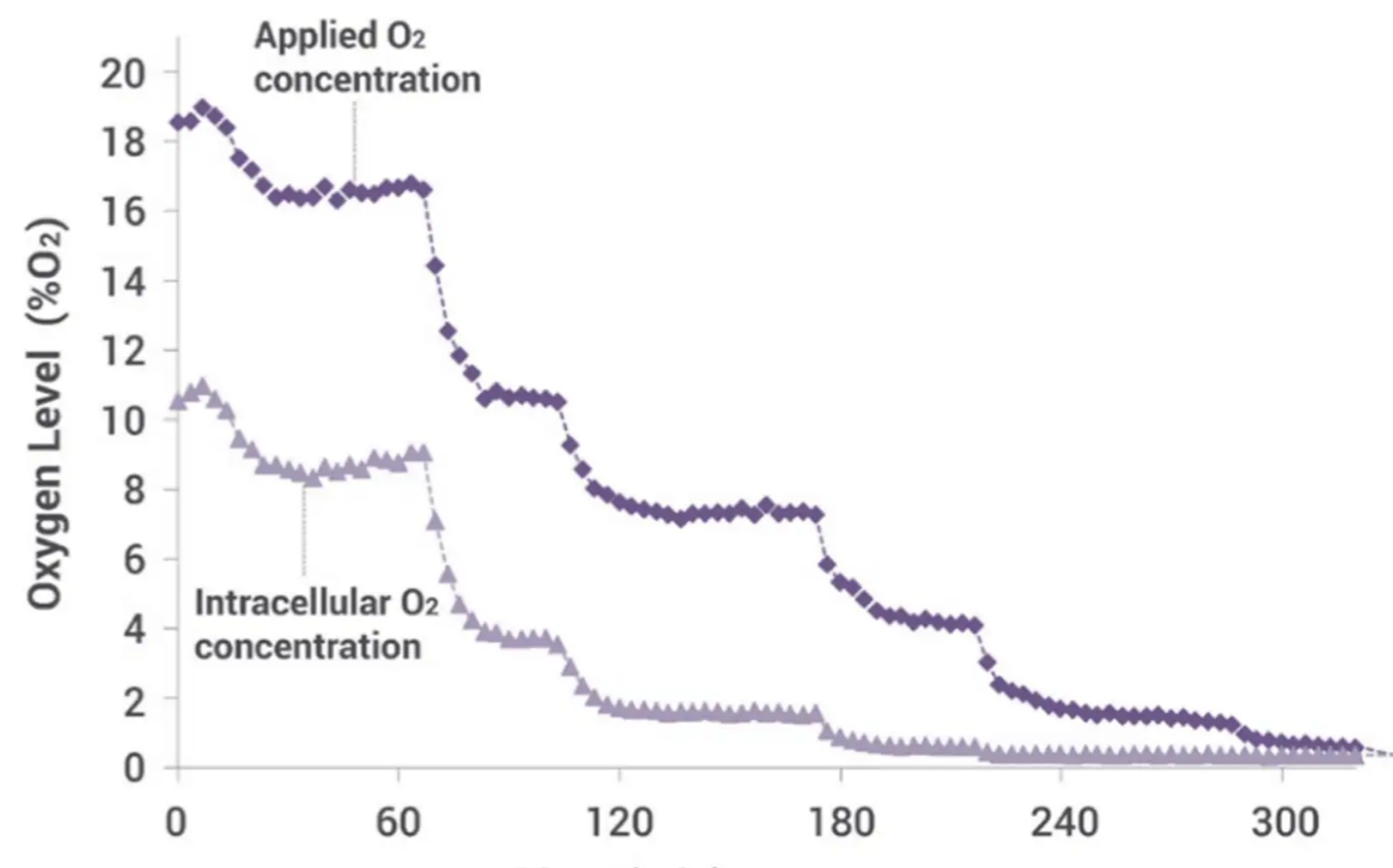
## Bioenergetic Profile

Further discernment with bioenergetic profiling provides deeper analysis of cell health. Understanding mitochondrial toxicity can help de-risk the drug discovery pipeline and ensure consumer safety.

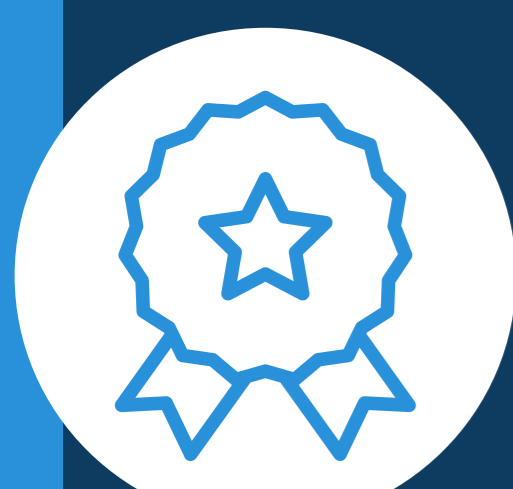


## Metabolic Assessment

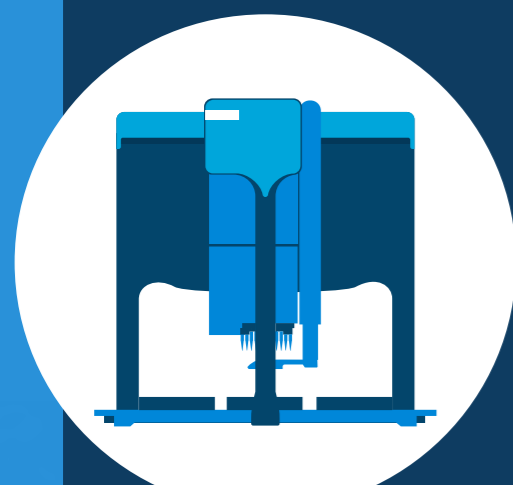
The collection of metabolic reactions that make up cell metabolism are fundamental to cell survival. Understanding these processes and how they support normal cell function can reveal a more intricate view of cell health.



## Workflow Considerations

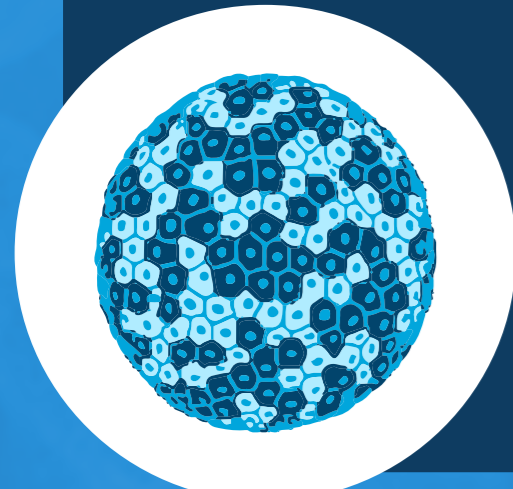


• Data may need to be collected from the same sample several times, as with real-time analysis, or a single endpoint measurement may suffice.



• Additional non-invasive methods such as label-free assessment can assure that observations are not influenced by the addition of a label.

• The ability to discern changes in cell state quickly through high temporal resolution can improve timelines and enable rapid assessment of many samples.



• High-throughput capabilities, including the use of automation to improve productivity and reproducibility, can also be important considerations depending on timelines and number of samples.

• Implementing 3D cell models in drug research is important for understanding the impact of cell health or drug toxicity in conditions that more closely resemble the environments of tissues or organs.

• Live cell analysis makes orthogonal assays possible, providing additional data and relevant insights.

• Compliance enabled software ensures authenticity, integrity, and confidentiality of raw electronic data. US FDA Part 11 in Title 21 of the Code of Federal Regulations (CFR) and its EU analog, Eudralex Volume 4, Annex 11, describe the requirements for electronic records and electronic signatures for regulated pharmaceutical organizations.

[Learn about Agilent solutions leveraging cell and molecular biology for drug research](#)

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