SYNERGY|H1
microplate reader

Designed for flexibility & performance

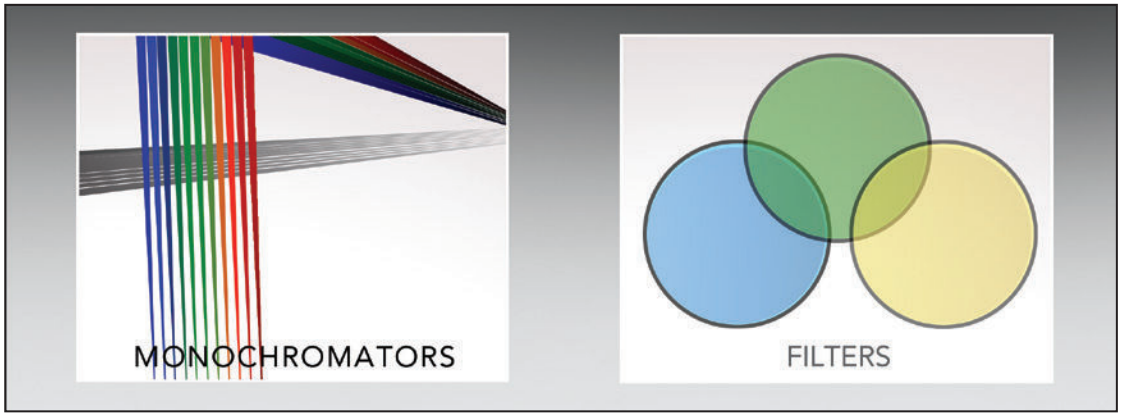
BioTek®
A part of **Agilent**

SYNERGY|H1

microplate reader

Synergy™ H1 is a configurable multi-mode microplate reader, with monochromator-based optics for flexibility, filter-based optics for sensitivity, or both…BioTek's patented Hybrid Technology™ offers applications versatility and excellent performance in a modular platform to expand as your laboratory's needs change.

Hybrid plate reader: flexibility and performance

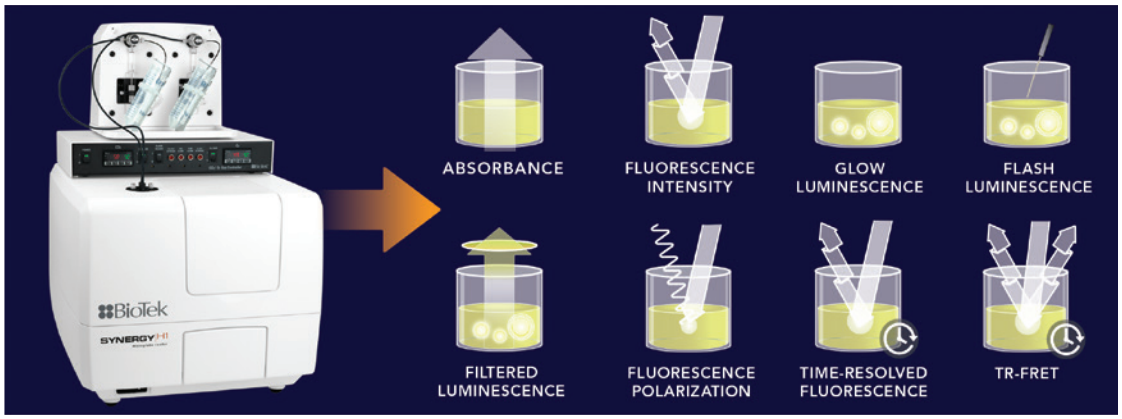


With its patented combination of monochromator and filter optics, Synergy H1 is an advanced plate reader that delivers both the flexibility and performance you need for any microplate assay in your lab.

Monochromator: variable bandwidth, UV-Vis absorbance, fluorescence intensity, luminescence

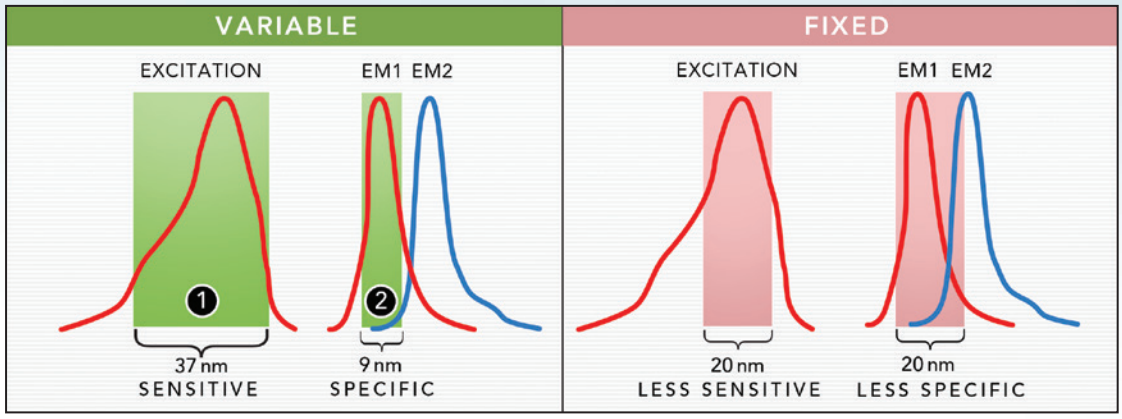
Filters: fluorescence intensity, polarization, time-resolved fluorescence, filtered luminescence

Ready for any assay



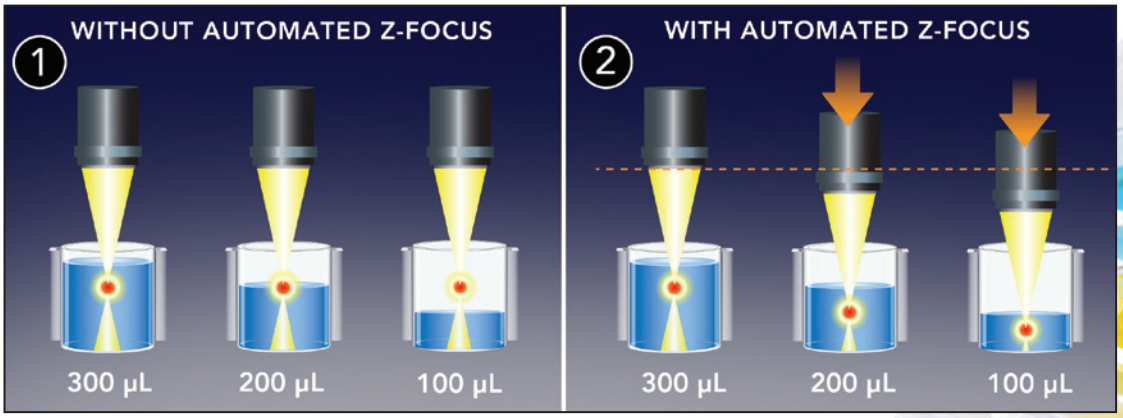
Synergy H1's modular design allows you to start with what you need now, and add detection modes, gas control and dual reagent injectors as your laboratory's workflows evolve.

Variable bandwidth for sensitivity and specificity



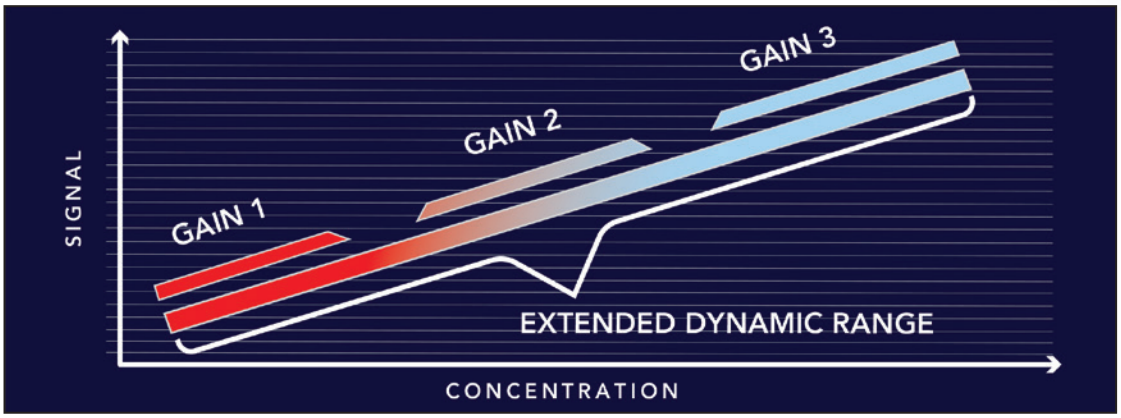
Synergy H1 offers quad monochromator optics with variable bandwidth. The excitation and emission bandwidths can be set between 9 nm and 50 nm, in 1 nm increments. Large bandwidths **(1)** provide increased sensitivity and lower limits of detection. Small bandwidths **(2)** provide increased specificity when multiple signals are present, reducing crosstalk and enhancing assay performance.

Automated z-focus: best performance with all plate types



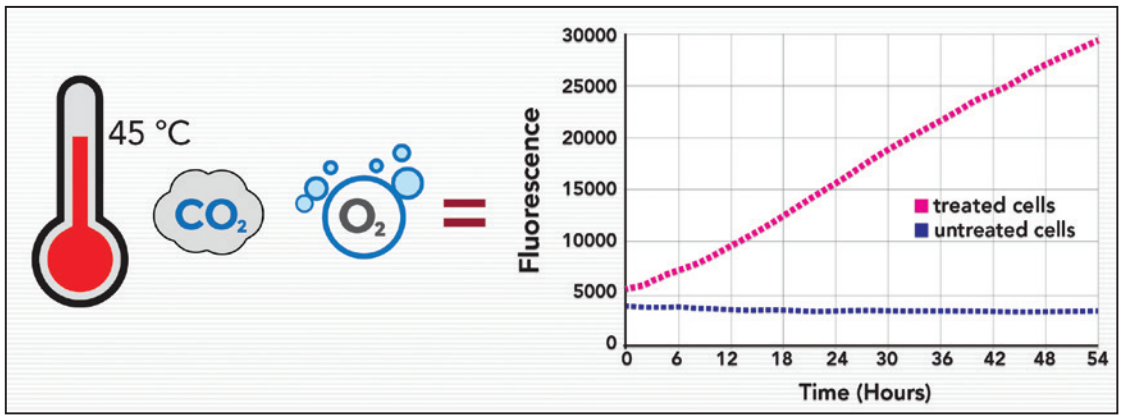
(1) Without automated z-focus available, performance at low volumes is affected. **(2)** With automated z-focus, reading height is precisely adjusted for best performance in all plate types and all volumes.

Extended dynamic range



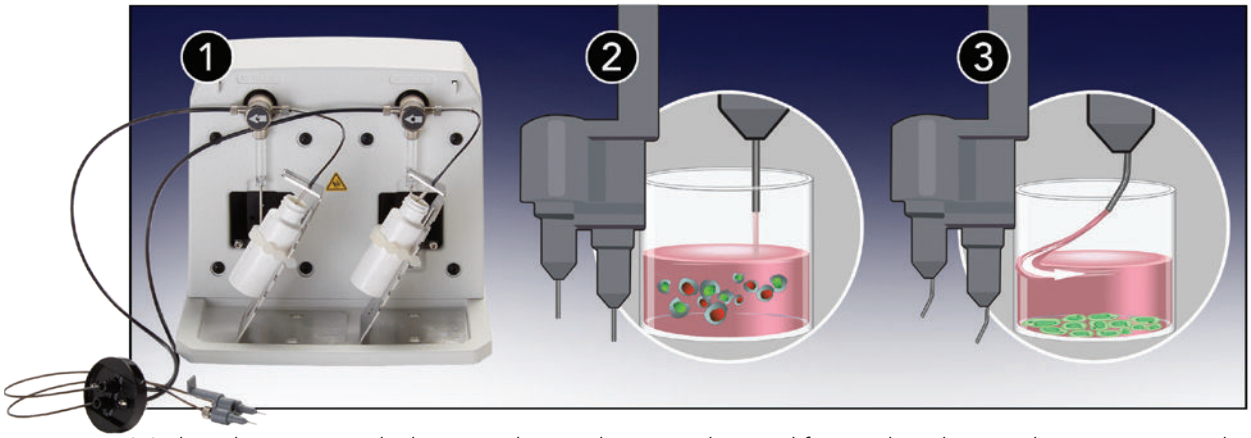
Synergy H1 offers an extended dynamic range, which allows detection of signals across a 7 log measurement range. Other systems can measure only small portions of the dynamic range of Synergy H1 using preset gains – this can cause reduced sensitivity on the low end or saturated signals on the high end of the assay signal range.

Environmental controls for cell-based assays



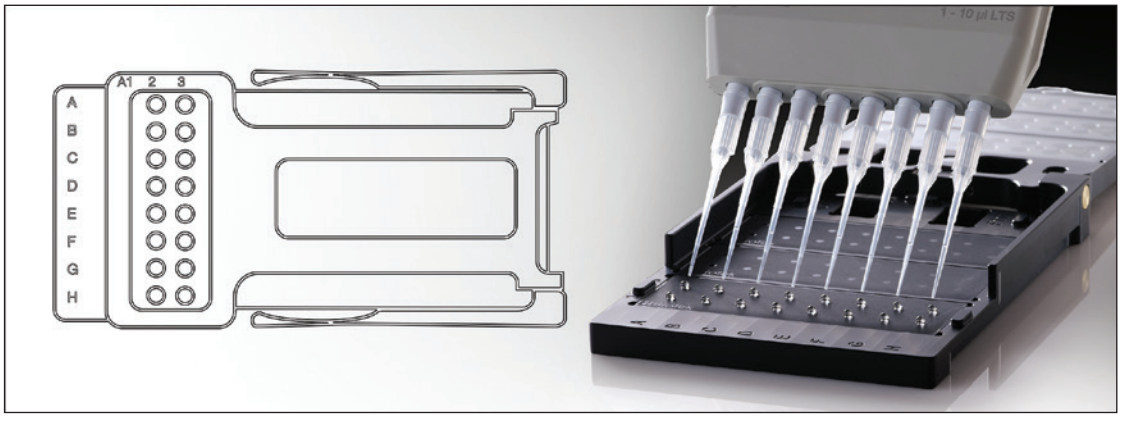
Temperature control to 45 °C, condensation control, CO_2/O_2 control and shaking create the ideal environment for live cell assay workflows. A consistent environment leads to consistent data for long-term kinetic assays.

Dual syringe injectors with specialized tips



(1) The robust precise dual syringe design eliminates the need for regular tubing replacement required by some peristaltic pump injector designs. Synergy H1 offers two tip types: **(2)** the straight tips enable vigorous mixing for rapid inject/read assays, and **(3)** the angled tip option won't disturb cell layers for applications such as calcium kinetics.

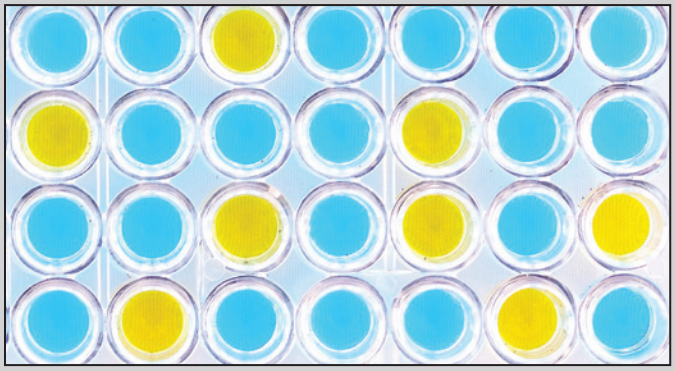
Micro-volume analysis with Take3 plate



Enable micro-volume analysis with the Synergy H1, using the Take3 Plate. Measure up to 16 or 48 samples in one run and save a lot of time, compared to single-sample devices. Gen5 has customizable protocols for ssDNA, dsDNA, RNA and protein quantification in 2 µL.

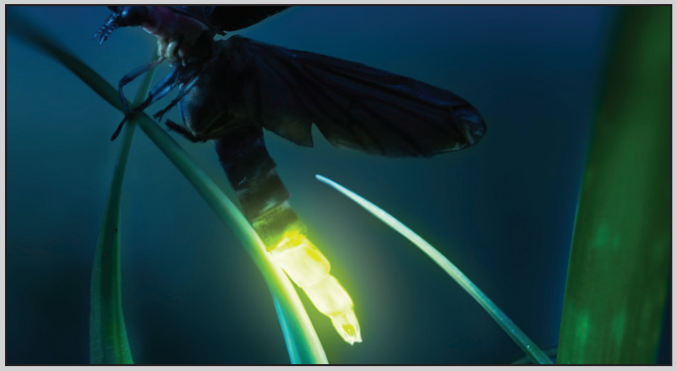
APPLICATIONS

ELISA



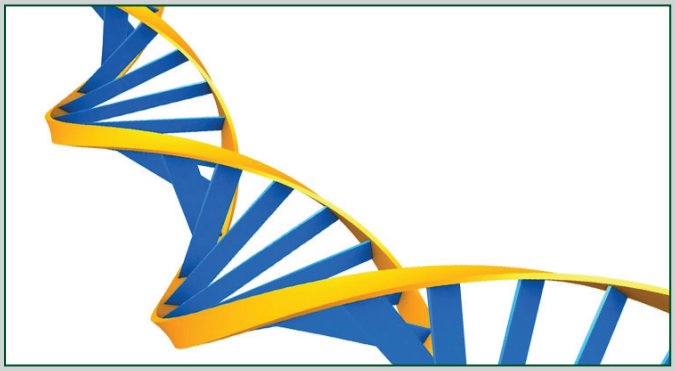
ELISA methods with colorimetric, fluorescent and luminescent substrates are easily detected with Synergy H1.

Luciferase reporter assays



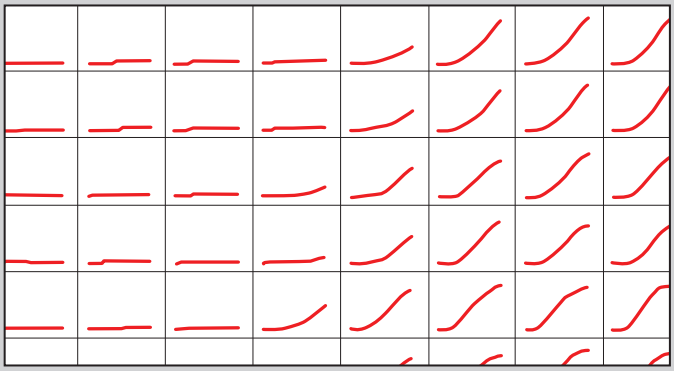
Luciferase-based reporter assays measure luminescent signal, allowing the quantification of the activity of factors affecting the signaling pathways under investigation.

Nucleic acid & protein quantification



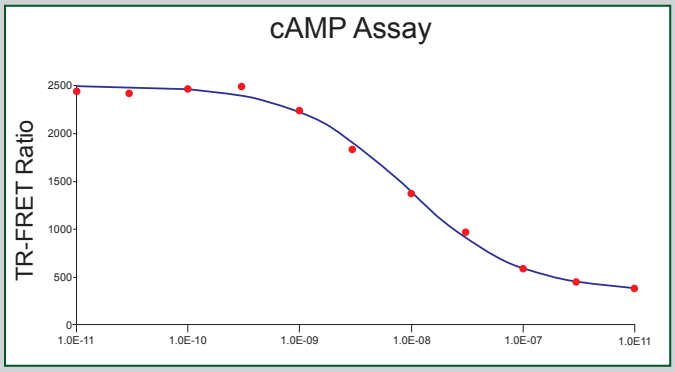
Nucleic acid and protein quantification assays can be executed by spectrophotometric or fluorescent determination with Synergy H1, in microplates or in micro-volumes with the Take3 Plate.

Microbial growth assays



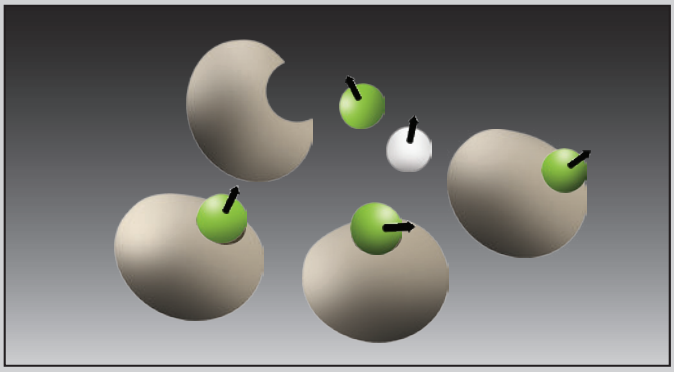
Microbial growth assays including yeast and bacteria can be measured by several methods, including turbidimetric measurements with Synergy H1.

TR-FRET



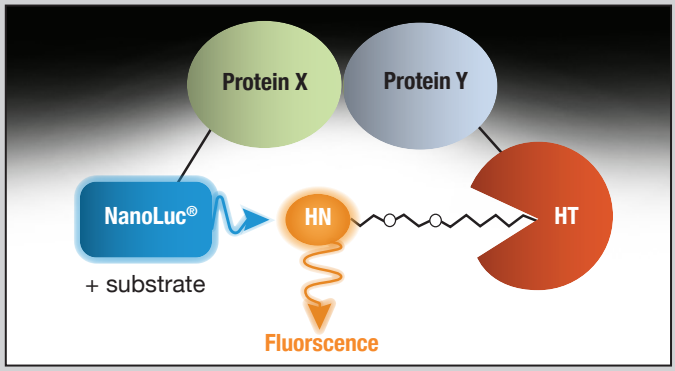
TR-FRET and HTRF® are sensitive, robust methods. Synergy H1 and Gen5 provide excellent sensitivity for optimal Z' factors.

Fluorescence polarization



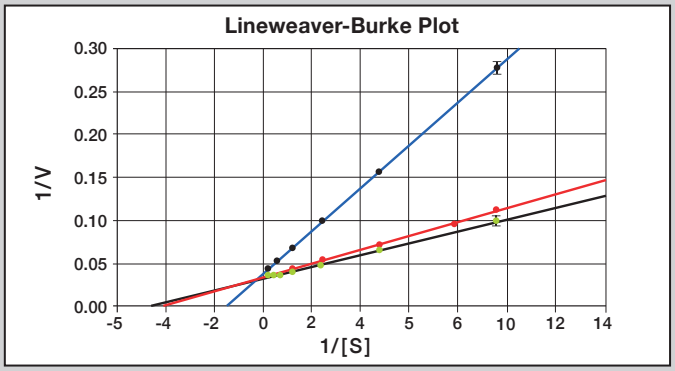
FP is widely used in research labs to study molecular binding or dissociation events and in screening labs to screen for drug candidates.

BRET



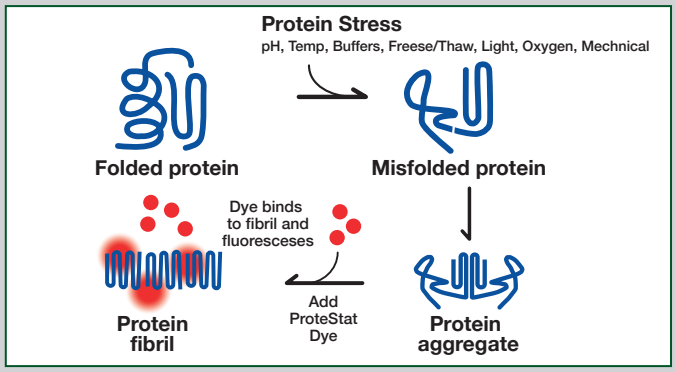
Bioluminescence resonance energy transfer (BRET) proximity assays enable detailed investigations of protein:protein interactions. BRET is easily detected with Synergy H1.

Enzyme Kinetics



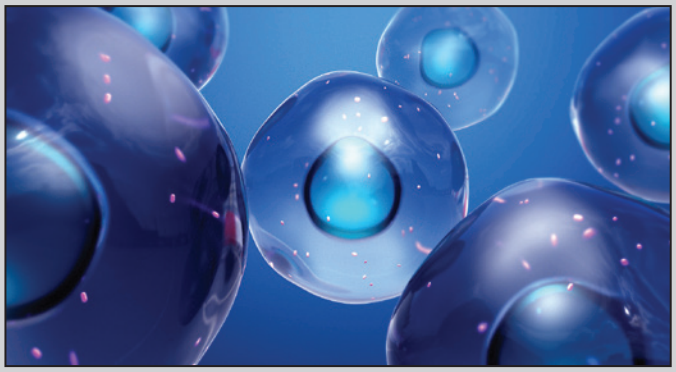
Measurement of enzyme reaction rates can easily be measured with Synergy H1. Gen5 software has built-in protocols for kinetic reactions, including Michaelis-Menten models for kinetic rate measurements.

Protein aggregation



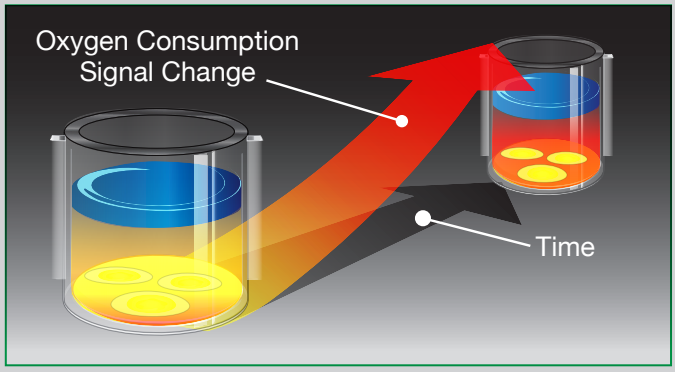
Synergy H1 has a robust shaking mechanism needed to quantify protein aggregation and amyloid formation via kinetic fluorescent measurements of Thioflavin T.

Cell-based assays



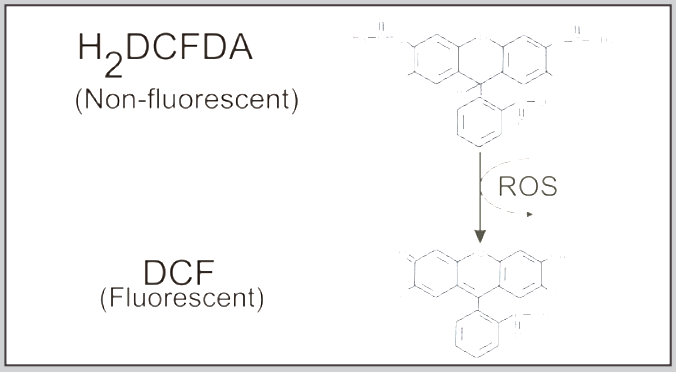
Cell based assays assess critical characteristics such as viability, toxicity, proliferation and cell death.

Metabolic activity



Use Agilent's MitoXpress and pH-Xtra kits to measure real-time metabolic markers such as Oxygen Consumption Rates (OCR) and Extracellular Acidification Rates (ECAR).

ROS



The formation of Reactive Oxygen Species (ROS) can be measured with the use of fluorescent probes in the Synergy H1.

PERIPHERALS

BioStack Microplate Stacker

BioStack manages up to 50 microplates for automated multi-mode operations, including de-lidding and re-lidding of microplates used with cell-based assays.

CO_2/O_2 Controller

The compact gas controller maintains control of CO_2 and O_2 levels in the Synergy H1 to support live cell assays.

Dual Reagent Injector

The dual reagent injector module enables fast inject/read processes. Angled injector tips protect cell monolayers from shear stress during injection.

Take3 Micro-Volume Plate

Measure multiple 2 µL samples at a time with the Take3 Micro-Volume Plate, used with Synergy H1. Micro-volume nucleic acid and protein quantification made fast and easy, for up to 16 or 48 samples at a time.

BioSpa 8 Automated Incubator

BioSpa's environmental controls and labware handling capabilities, integrated with Synergy H1, facilitate assays from ELISA to long term live cell kinetic processes for up to 8 microplates.

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TECHNICAL DETAILS

General	
Detection modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
Wavelength selection	Monochromators for fluorescence intensity, UV-Vis absorbance, luminescence. Filters for fluorescence intensity, time-resolved fluorescence ,fluorescence polarization and filtered luminescence
Monochromator bandwidth	Fixed, 16 nm Variable; from 9 to 50 nm, in 1 nm increments ("H1M2" configurations)
Read methods	Endpoint, kinetic, spectral scanning, well area scanning
Microplate types	6- to 384-well plates
Other labware supported	Take3 Micro-Volume Plates
Environmental controls	4-Zone™ incubation to 45 °C with Condensation Control™ CO_2/ O_2 controller available
Shaking	Linear, orbital, double orbital
Automation	BioStack and 3rd party automation compatible BioSpa 8 Automated Incubator compatible
Software	Gen5™ Microplate Reader and Imager Software Gen5 Secure for 21 CFR Part 11 compliance (option)
Modularity and configurability	Synergy H1 has many available configurations. Detection modules and peripherals can be added as laboratory needs change.

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