Agilent

Trusted Answers

Agilent BioTek Lionheart FX Automated Microscope

Small, powerful, and versatile–a perfect fit for any lab

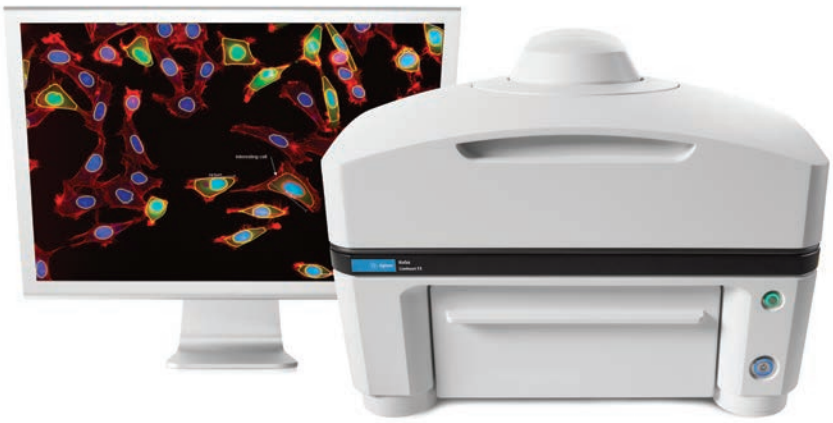
Agilent BioTek Lionheart FX Automated Microscope

Agilent BioTek Lionheart FX automated microscope.

The Agilent BioTek Lionheart FX automated microscope is a compact system that is ideal for a broad range of imaging workflows. It offers up to 60x air, and 60x and 100x oil-immersion magnification, with fluorescence, brightfield, color brightfield, and phase contrast channels for maximum application reach. An optional environmental control cover provides incubation to 40 °C and effective containment for CO_2/O_2 control; a humidity chamber optimizes conditions for long-term live cell imaging applications; and an available dual-reagent injector facilitates rapid kinetic assays.

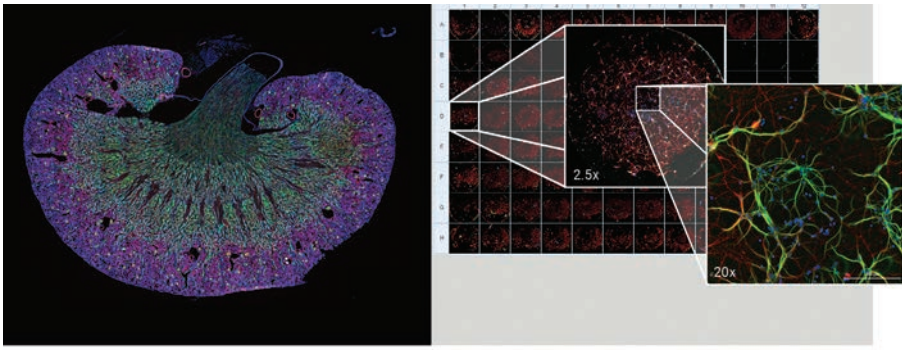
Small benchtop footprint

The Lionheart FX has a small footprint and is easily installed on a standard lab bench with no need for a dedicated darkroom.



High-quality optical components

Lionheart FX uses high-quality Olympus objectives and Semrock filters, which drive excellent image quality and performance.

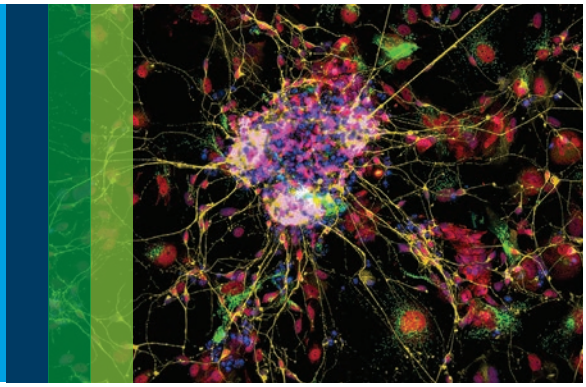


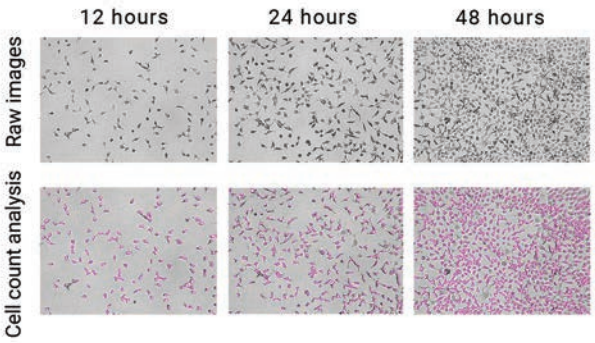
Wide field of view

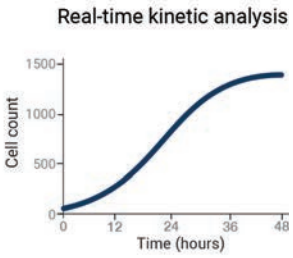
The wide field of view (WFOV) camera provides fast, automated imaging in microplates and slides. Large tissue sections (left) and microplates (right) can be imaged from low to high magnifications.

Agilent BioTek Lionheart FX automated microscope

For stunning digital images and detailed quantitative analysis

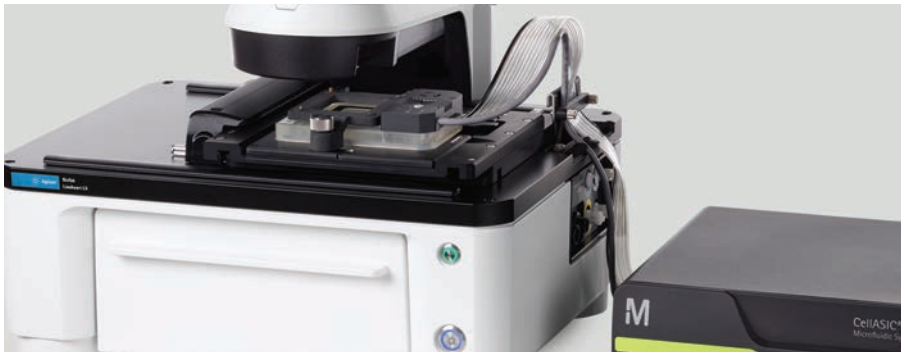






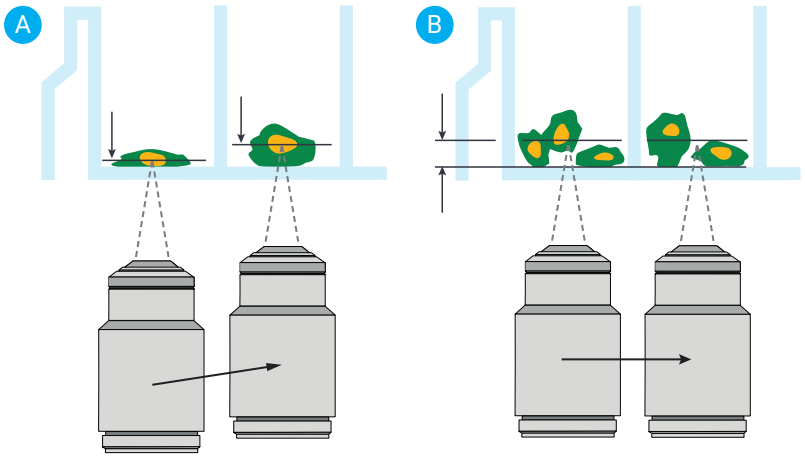
Environmental controls for live cell imaging

Successful live cell kinetic imaging relies on a consistent environment, including temperature, CO_2/O_2, and humidity control. Lionheart FX provides the perfect environment to grow and analyze live cells over time. Powerful movie maker and kinetic analysis software tools allow visualization and analysis of time-lapse experiments.



Open-stage design

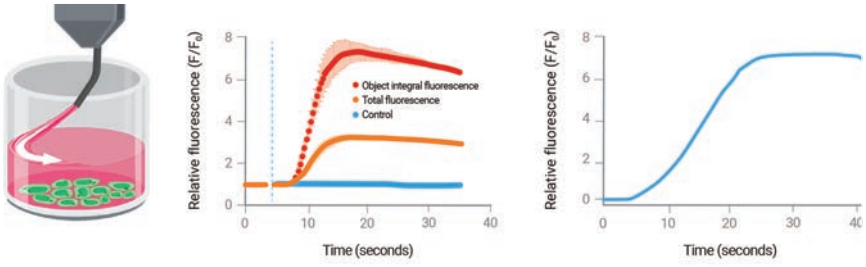
The open design of the Lionheart FX stage allows researchers to work with microfluidic devices.



Laser and image autofocus

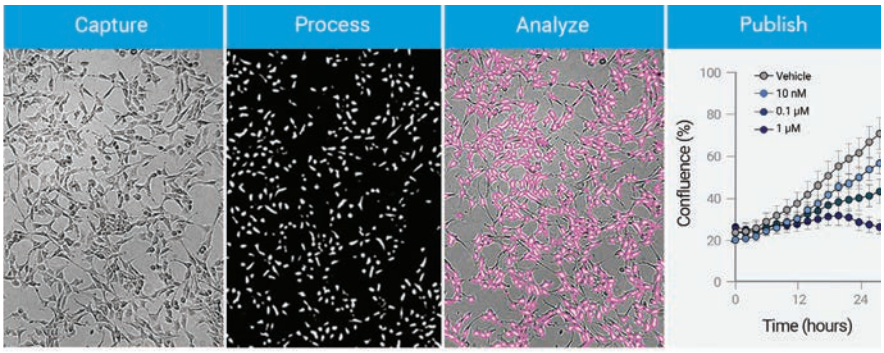
A. Image-based autofocus is available on all Agilent BioTek imaging systems. It focuses on the plane of highest contrast in the sample, including "shifting" biology within the well.

B. Laser autofocus uses the same focal offset from well to well and is typically faster. It works with dim fluorophores and helps prevent phototoxicity and photobleaching. Laser autofocus also offers better reproducibility and higher accuracy during long-term kinetic imaging.



Dual-reagent injector module

The dual-reagent injector module for Lionheart FX allows fast cellular reactions to be imaged after the addition of a reagent.

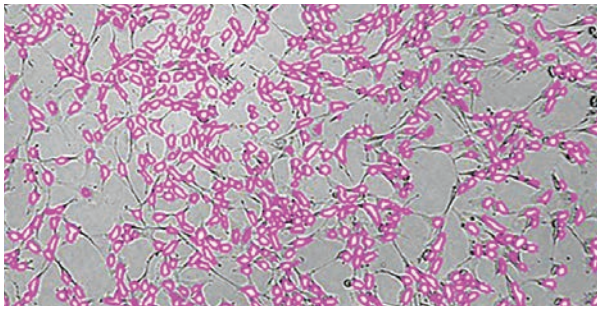


Augmented microscopy

Lionheart FX and Agilent BioTek Gen5 microplate reader and imager software work together for a fully automated capture, process, analyze, and publish workflow. Unlike many other microscopes, the Lionheart platform provides users with complete microscopy workflow control, all the way from image capture to publication-worthy results.

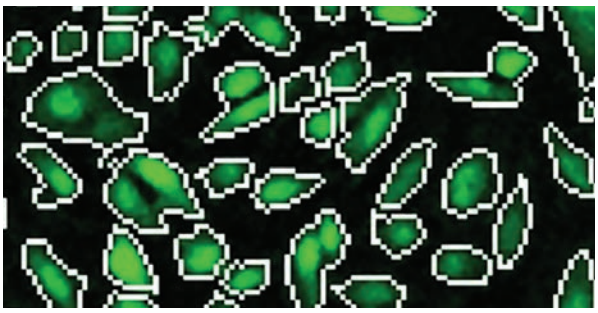
Applications–imaging

Label-free cell counting



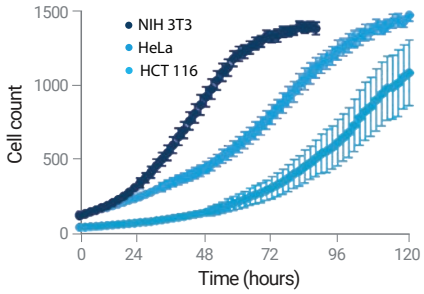
Use high-contrast brightfield imaging for accurate, label-free cell counting without the need for cell-labeling dyes.

Calcium kinetics



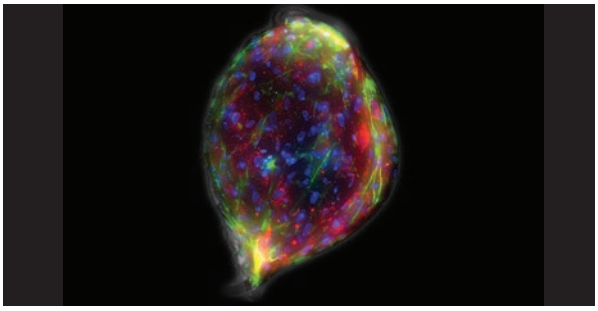
The Lionheart FX dual-reagent injectors enable capture and analysis of fast inject/image assays like calcium kinetics.

Time-lapse live cell imaging



Cell proliferation studies require controlled environments. Lionheart FX automates image capture through analysis.

3D cell culture

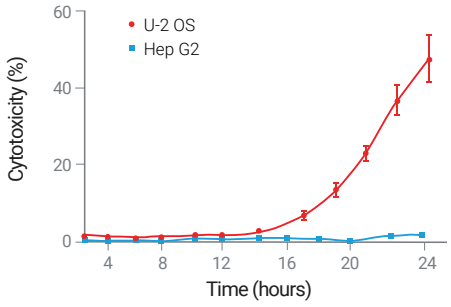


Automate 3D spheroid and tumoroid assays using environmental control and Agilent BioTek Automated Media Exchange with an Agilent BioTek liquid handler. Z-stack, Z-project, and analyze with Gen5 software.

Microbiology

High-magnification objectives, multiple imaging channels, and advanced image analysis capabilities enable analysis of a variety of microorganisms.

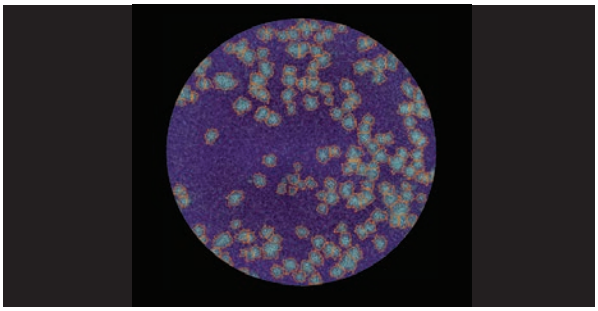
Cell viability/toxicity



Classic live/dead assays use fluorescent probes or membrane-impermeable dyes; viability or toxicity is measured in real time.

Applications–imaging

Virology

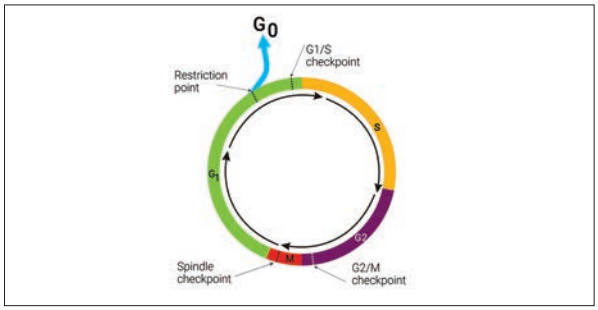


The flexibility of Lionheart FX and Gen5 software enables a variety of assays to be imaged and analyzed when performing viral research.

Whole-organism imaging

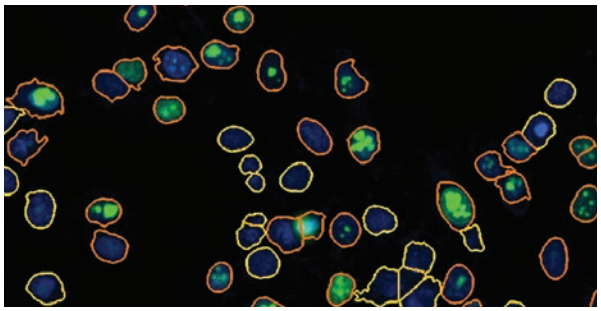
Essential to current drug screening methods, whole organisms like zebrafish and nematodes are effectively imaged and analyzed with Lionheart FX and Gen5 software.

Cell cycle analysis



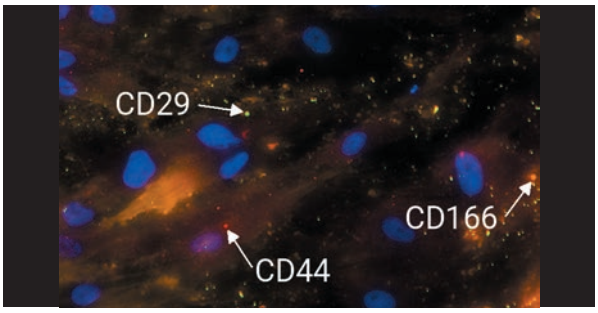
The progression of cell growth though the cell cycle is a highly regulated process. Automated histogram analysis of objects facilitates threshold definition.

Transfection efficiency



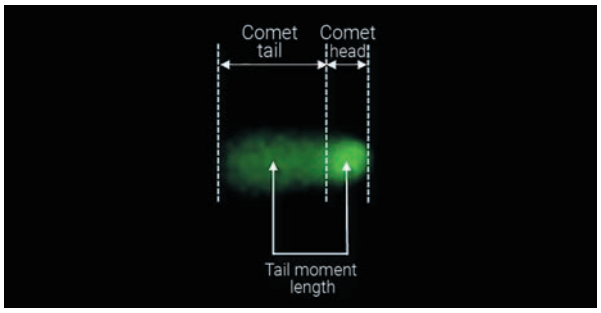
Lionheart FX provides intuitive image analysis for automating the assessment of transfection efficiency.

Stem cell differentiation



Lionheart FX automates analysis of the lengthy process of stem cell differentiation to find highly physiologically relevant cells for drug discovery.

Genotoxicity

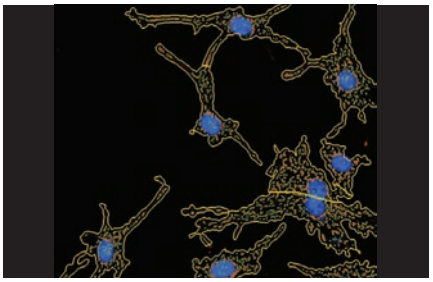


The destructive effects of mutagens such as high-energy radiation and chemicals on nuclear DNA are measured with the comet assay and H2AX immunofluorescence assays. Lionheart FX is an ideal imaging platform for these assays.

Advanced Gen5 image analysis modules

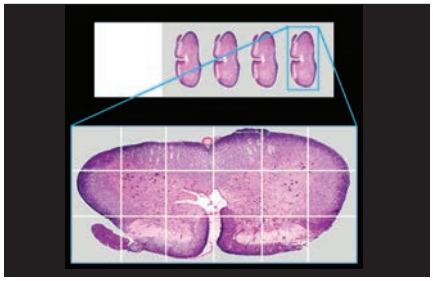
Beyond the powerful analysis features in Gen5 software, specialized add-on modules expand method-specific analyses to automate processes and generate advanced metrics.

Spot counting



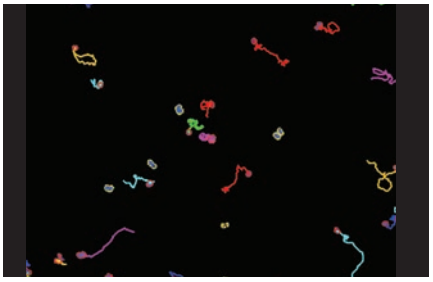
The Agilent BioTek Gen5 spot counting module enables users to gain information about a second set of objects within primary and/or secondary mask compartments, which are tied to the original primary mask data.

Automatic region of interest



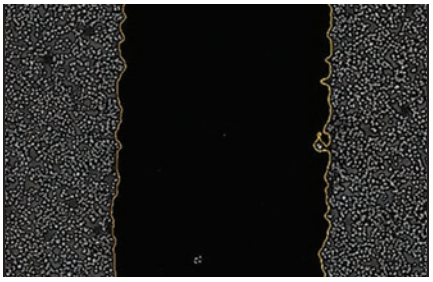
The automatic region-of-interest (AutoROI) module is a three-step process to eliminate superfluous image capture. A low magnification step quickly images the entire area. The regions of interest are automatically identified, and then imaged at high magnification.

Single object tracking



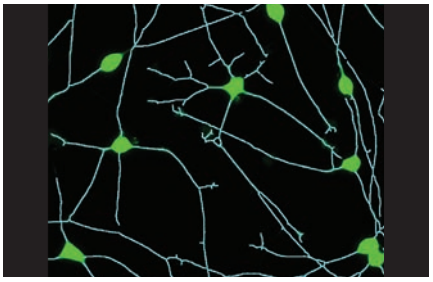
The Agilent BioTek Gen5 object tracking module provides the ability to track single objects over time. Relative motility can be visualized by selecting single cells or entire populations within an image. Calculated metrics include total distance, Euclidean distance, and mean, median, and maximum object velocity.

Scratch Assay app



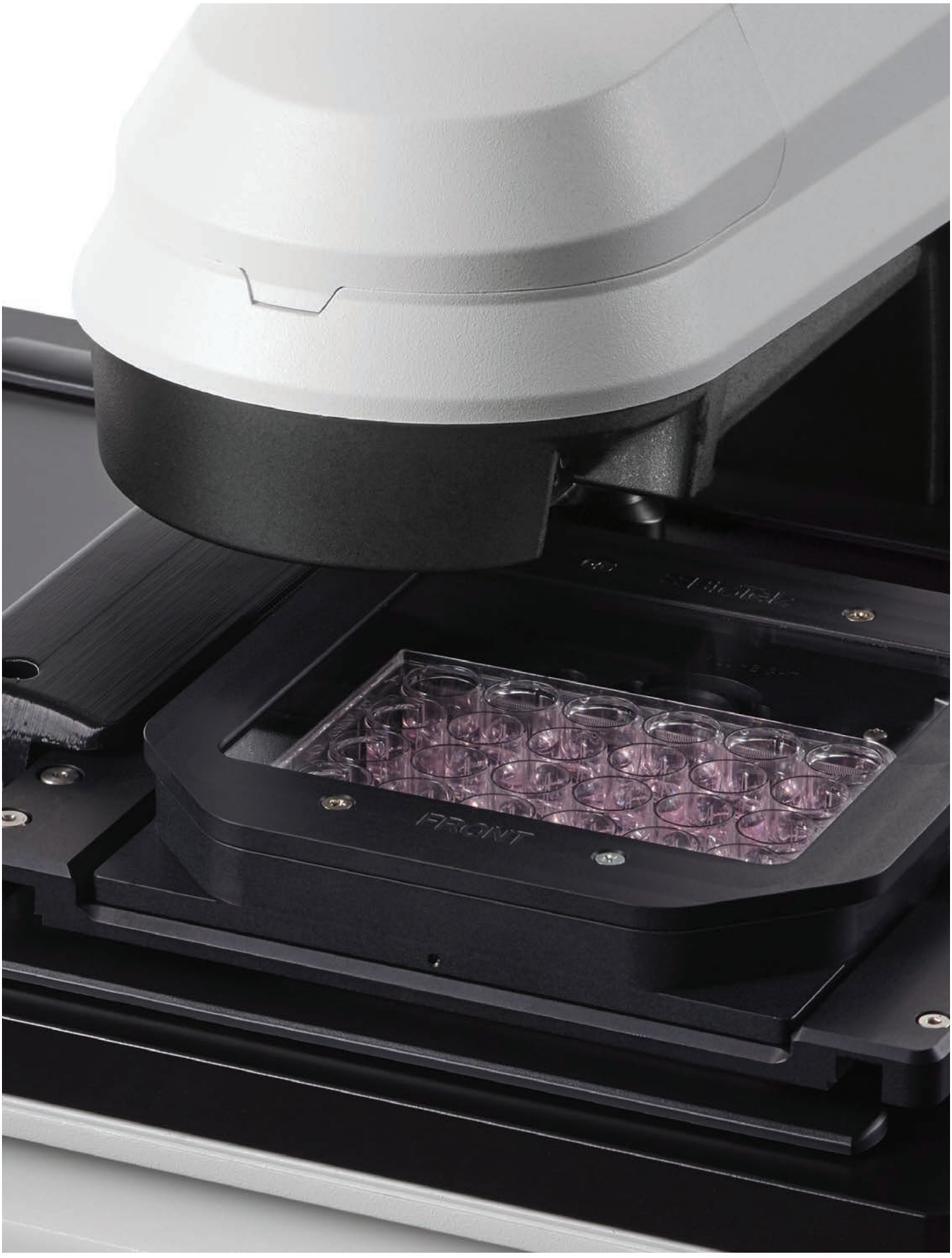
The Agilent BioTek Scratch Assay app provides an integrated workflow to capture, process, and analyze images from 2D scratch-wound healing assays. Predefined protocols for 24- and 96-well plates include automated processing and analysis to calculate average wound width, percent wound confluence, and maximum wound healing rate.

Neurite outgrowth



The Agilent BioTek Gen5 neurite outgrowth module accurately quantifies neuronal cell metrics and provides masking options including soma and neurite masks, along with skeletonized images. The module also accurately detects neuronal outgrowth in kinetically monitored, unlabeled live cells.

Agilent BioTek Lionheart FX automated microscope shown with CO_2/O_2 gas controller and dual-reagent injector.


FRONT

Agilent BioTek Lionheart FX
automated microscope

Technical Details

General	
Microplate Types	6- to 1536-well plates
Other Labware Supported	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25, T75), counting chambers (hemocytometers), chamber slides Support for labware up to 1.5" tall
Software	Gen5 microplate reader and imager software (included) Optional Agilent BioTek software: – Gen5 Image+: Image analysis – Gen5 Image Prime: Advanced image analysis – Gen5 Secure, Gen5 Secure Image+, Gen5 Secure Image Prime: Enables 21 CFR Part 11 compliance – Neurite outgrowth, AutoROI module, spot counting module, object tracking module, scratch assay app
Imaging	
Imaging Modes	Fluorescence, brightfield, high-contrast brightfield, color brightfield, and phase contrast
Imaging Methods	Single color, multicolor, montage, time lapse, Z-stacking, Z-stack montage
Image Processing	Z-projection, digital phase contrast, stitching
Light Source (Fluorescence)	User-replaceable LEDs (available wavelengths: 365, 390, 405, 465, 505, 523, 590, 623, 655, and 740 nm)
Camera	Sony CMOS 16-bit grayscale camera
WFOV Mode	3.42 x 3.42 mm at 4x magnification
Image Outputs Available	Raw images: 16-bit TIFF Saved images: TIF, JPG, BMP, PNG, EMF, GIF
Filter Cube Capacity	Four user-replaceable fluorescence cubes
Filter Cubes Available	DAPI, CFP, GFP, YFP, RFP, Texas Red, CY5, CY7, acridine orange, CFP-FRET, CFP-YFP FRET, chlorophyll, phycoerythrin (PE), propidium iodide, CY5.5, TagBFP, Tag BFP-FRET, GFP (Ex)-CY5 (Em), RFP (Ex)-CY5 (Em), Alexa Fluor 568, Ex 377/Em 647, oxidized roGFP2, TRITC
Objective Capacity	Six-position automated turret for user-replaceable objectives
Objectives Available	Air: 1.25x, 2x, 2.5x (2.75x eff), 4x, 10x, 20x, 40x, 60x Oil: 60x, 100x
Phase Objectives Available	4x, 10x, 20x, 40x
Image Capture Throughput	Laser autofocus, 20x, 100 ms exposure, 96 wells: 4 min, 4 s Software autofocus, 20x, 100 ms exposure, 96 wells: 7 min, 3 s
Automated Functions	Autofocus, user-trained autofocus, auto-exposure, autoLED intensity
Autofocus Method	Image-based autofocus Laser autofocus (option)
Microscope Stage Control	Gen5 software control Optional joystick controller
Physical Characteristics	
Dimensions	With cover closed or without cover: 18.3" D x 17.9" W x 14.1" H (46.5 x 45.5 x 69.8 cm) With cover fully open: 18.3" D x 17.9" W x 27.5" H (46.5 x 45.5 x 69.8 cm)
Weight	With top cover: 58 lb (26.3 kg) Without top cover: 51 lb (23.1 kg)
Power	External 250 W (minimum), 24 VDC power supply compatible with 100–240 VAC at 50–60 Hz

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