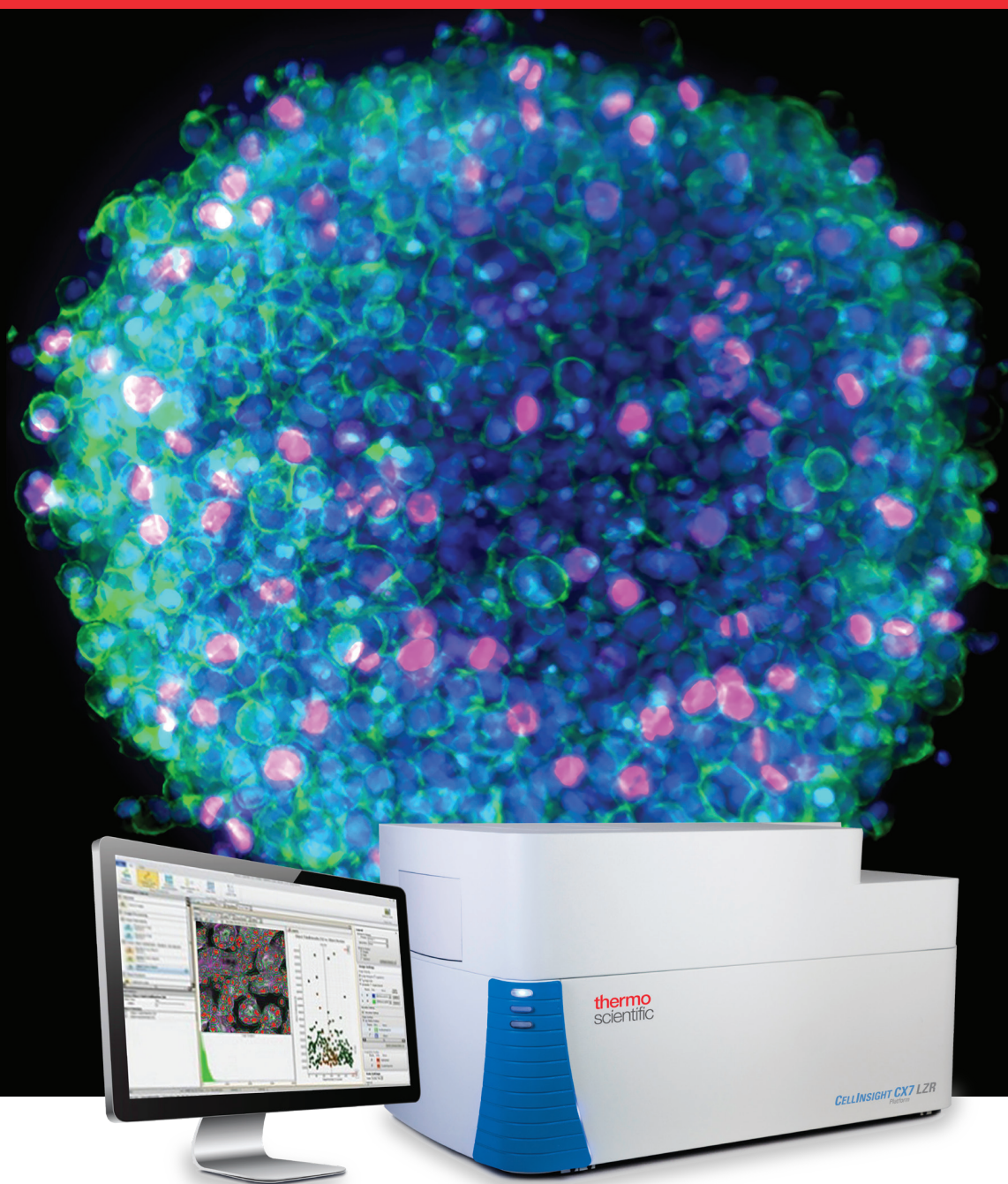# A legacy of innovation and discovery

CellInsight CX7 LZR High Content Analysis Platform

Thermo Fisher
SCIENTIFIC

Quantifiably brilliant data

Since the introduction of Thermo Scientific™ ArrayScan™ High Content Analysis (HCA) Readers in 1999, over 1,000 peer-reviewed cellomics publications attest to a legacy of innovation in high content analysis that continues with the introduction of the Thermo Scientific™ CellInsight™ CX7 LZR High Content Analysis Platform.

HCA comprises a powerful combination of fluorescence microscopy, image processing, automated cellular measurements, and informatics tools to extract quantitative data from cell populations (Figure 1). This technology has enabled fundamental discoveries in basic research—and progression in drug compound discovery.
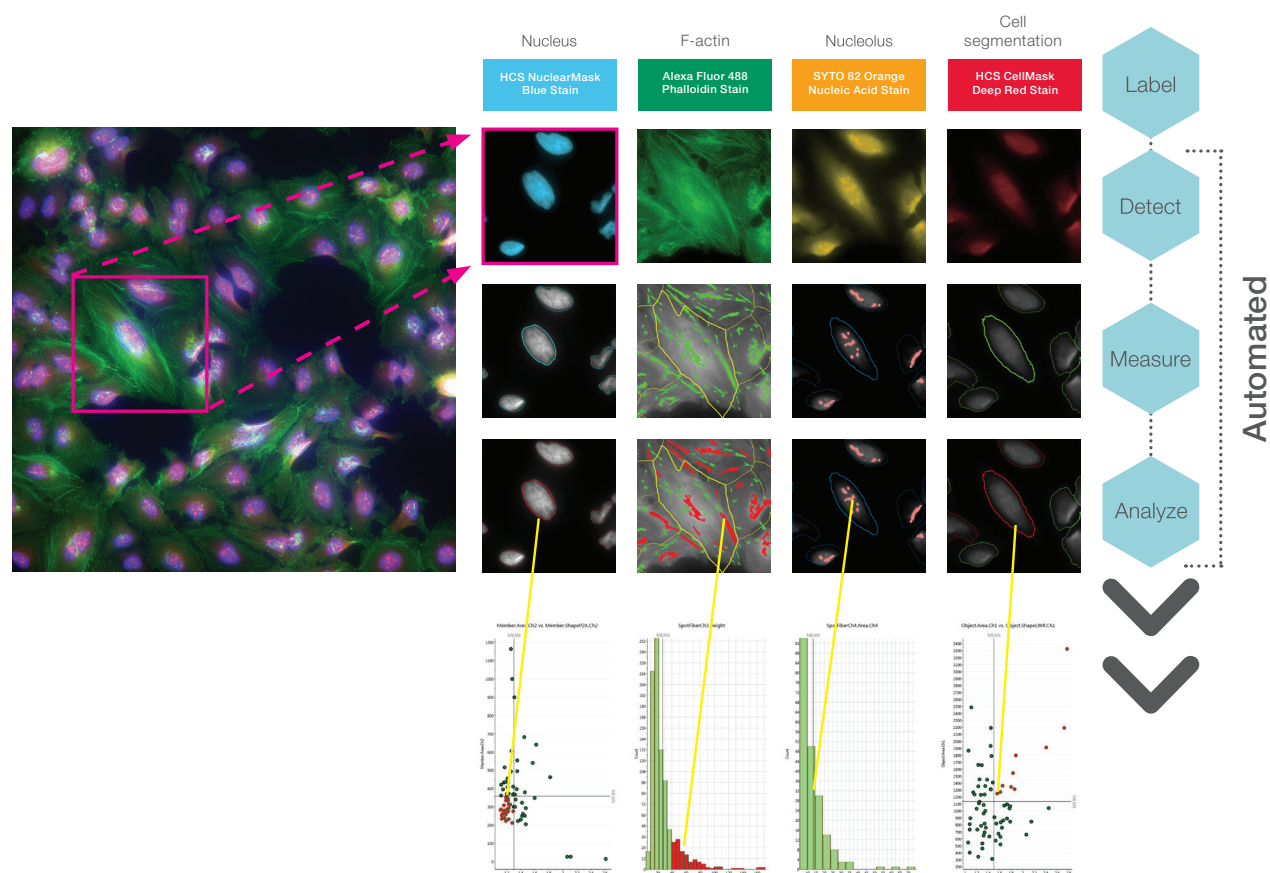
Evolution of our HCA systems

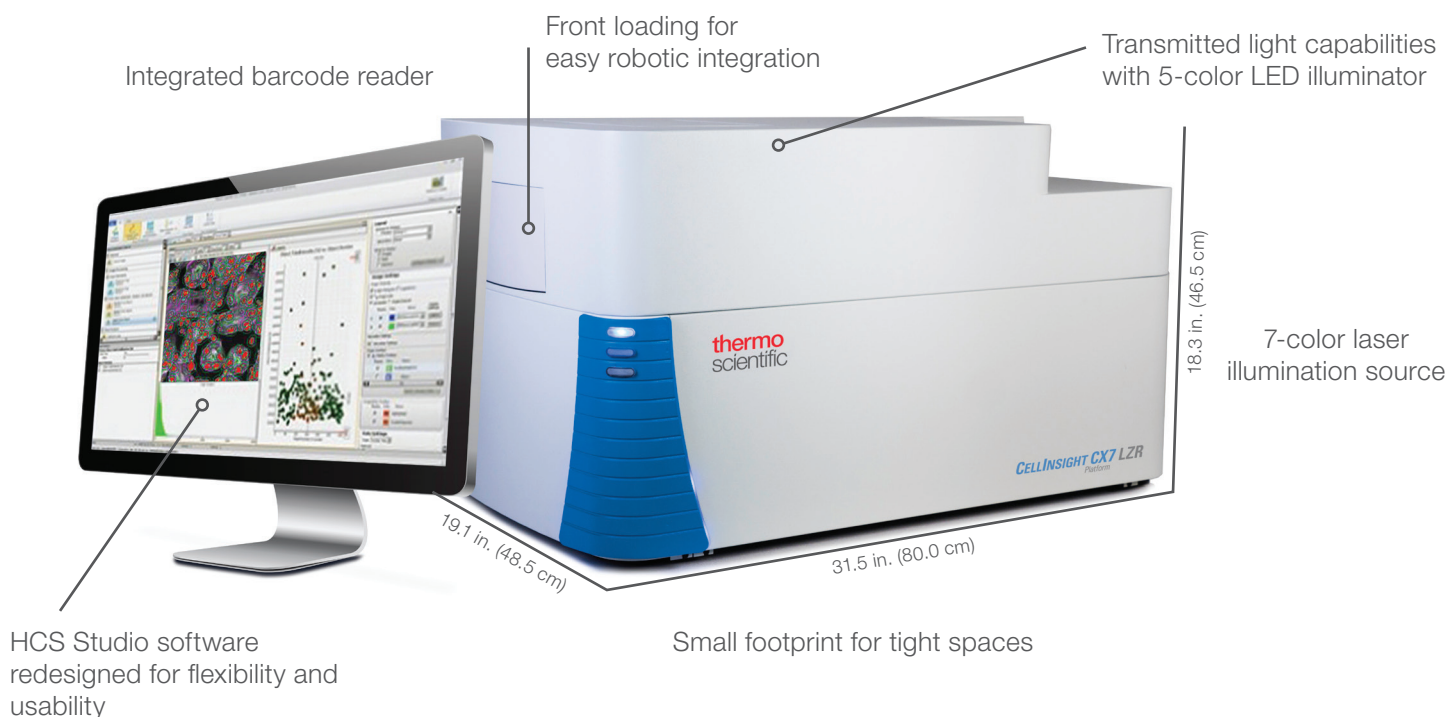**Figure 1. Automated imaging and quantification of multiple targets.**

Enhanced speed and sensitivity for superior performance

The CellInsight CX7 LZR High Content Analysis Platform delivers superior performance for the diverse combinations of experiments and cell types that are emerging in cell-based assays.

- Perform confocal or 3D imaging with extremely bright illumination to penetrate thick samples

- Speed up acquisition of images with short exposure times and laser autofocus capabilities

- Expand your multiplexing with near-IR (785 nm) laser excitation

- Reduce photobleaching and phototoxicity by controlling the amount of light reaching the sample for live-cell imaging and analysis

- Explore hundreds of different biological assays with the most affordable laser-based high content platform

Whether you are using a high content platform for primary or secondary screening, or you have a specific assay that you are developing, the CellInsight CX7 LZR platform provides you with a broad set of tools for quantitative imaging and analysis.

- Objective range from 2x to 60x available

- Broadest range of plate formats and types that are compatible with the system

- Expand your capabilities with optional onstage incubation and robotic plate handling

- Seamlessly scale and share your data using Thermo Scientific™ Store™ Image and Database Management Software

- Use the world-class Thermo Scientific™ HCS Studio™ suite of software to build and screen your cell-based assays

Integrated barcode reader

Front loading for easy robotic integration

Transmitted light capabilities with 5-color LED illuminator

18.3 in. (46.5 cm)

7-color laser illumination source

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CELLINSIGHT CX7 LZR Platform

19.1 in. (48.5 cm)

31.5 in. (80.0 cm)

HCS Studio software redesigned for flexibility and usability

Small footprint for tight spaces

Broad fluorophore choice for easy multiplexing

Compatible with glass slides and multiwell plates (6–1,536 wells)

Flexible imaging options

Biology happens cell by cell, and you need the right optical tools to capture all of it. With the CellInsight CX7 LZR High Content Analysis Platform, you have a choice of imaging modes and setup tools to extract the information you need from your samples. Whether well by well or channel by channel, you can select the right modes to read your sample—with the sensitivity and dynamic range enabled by a high-performance optical train and a sensitive camera.

Confocal

Illuminated by 7 wavelength-specific lasers, confocal imaging with high-speed spinning disk technology enables greater assay and sample flexibility (Figures 2 and 3). With two distinct pinhole patterns, confocal imaging is optimized for both thin and thick samples. Decrease your confocal scan times by more than half by pairing high–numerical aperture (NA) objectives, laser illumination, and ultrasensitive CCD camera technology.
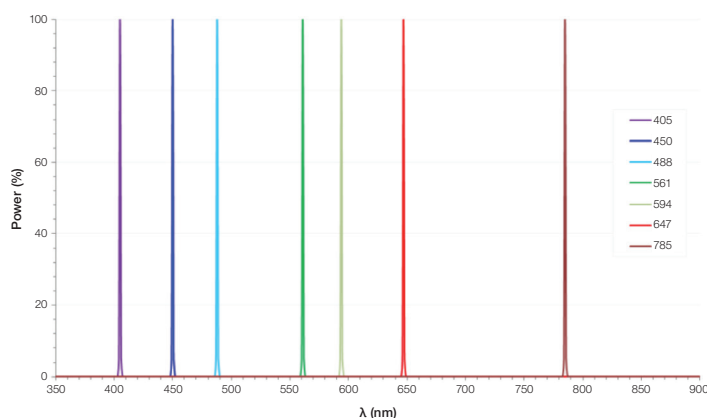
Widefield

Leverage the widefield capabilities of the CellInsight CX7 LZR platform for high-throughput cell-level phenotyping. With 7-color laser excitation, capture more information from each cell as you label additional targets. Be confident that you can screen more compounds with the large-format Photometrics™ X1 CCD camera and integrated laser autofocus so that none of your precious cells are missed.

Brightfield

Using an LED array for RGB and amber illumination, you can make colorimetric absorbance measurements of your histology samples with classic stains like hematoxylin and eosin (H&E). You can also multiplex your colorimetric absorbance data with fluorescence measurements, offering new possibilities for validation and correlation.
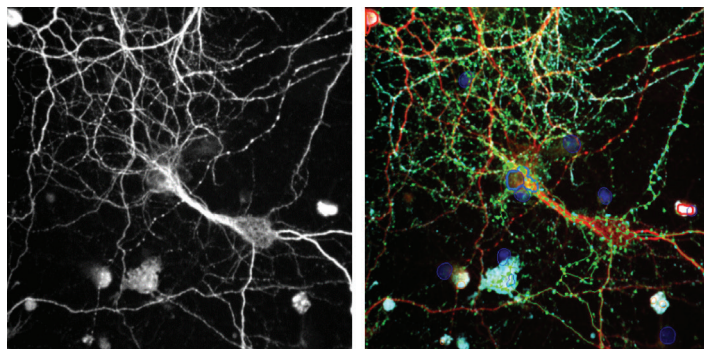

Figure 2. Laser wavelengths from the 7-color excitation laser light source.

Figure 3. Neurons imaged in confocal modes using the CellInsight CX7 LZR platform with 40x objective.

Intuitive software, powerful analysis

HCS Studio software

HCS Studio Cell Analysis Software is the engine behind the CellInsight CX7 LZR High Content Analysis Platform and all Thermo Scientific™ high content analysis products. This intuitive icon-based tool collects data cell by cell until it can report with statistically relevant assay performance. Faster, more meaningful results are enabled because:

• You configure your assay quickly in a simple, icon-based interface (Figure 4)

• Image acquisition is fully automated—with multiple channels and imaging modes (Figures 5–7)

• Acquisition is intelligent—analyzing only enough cells for statistical relevance

• "On the fly" real-time analysis, enabling faster acquisition of data

• You can go from image collection to tabulated results and population statistics in minutes

• Link data seamlessly to both images and protocols

• Move from tabulated data to view cells, wells, or fields
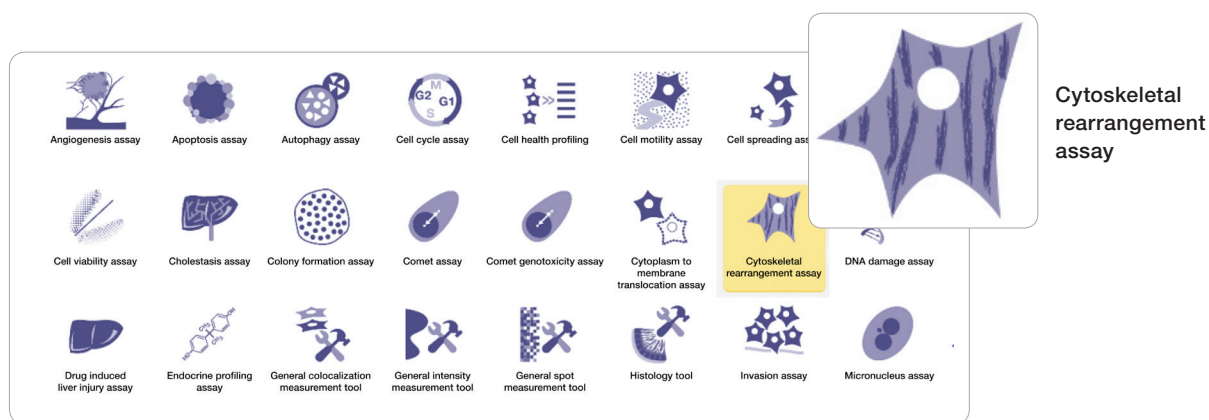

Cytoskeletal rearrangement assay

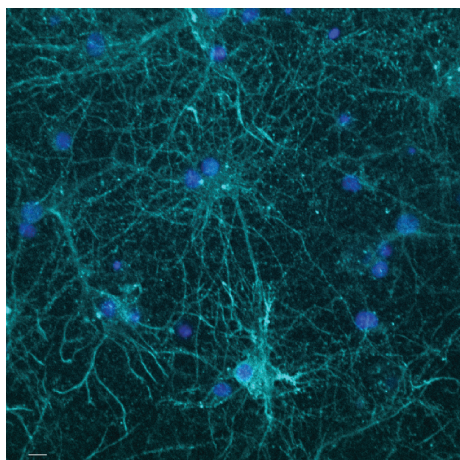Figure 4. Icon-based guidance, accessible to novice users.

Figure 5. Hippocampal primary neurons imaged on the CellInsight CX7 LXR platform using laser autofocus and confocal acquisition with 40x objective.
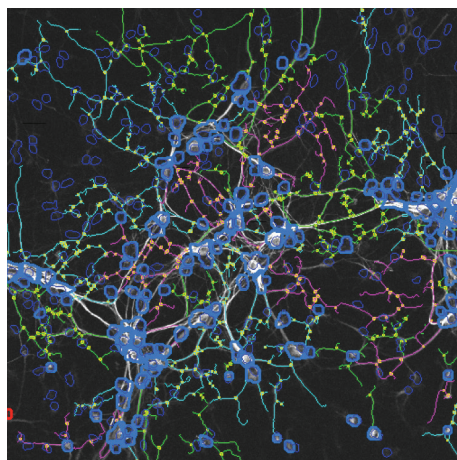
Figure 6. Automated identification of nuclei stained with Hoechst™ 33342 stain and neurites labeled with Invitrogen™ Alexa Fluor™ 488 conjugated secondary antibody.
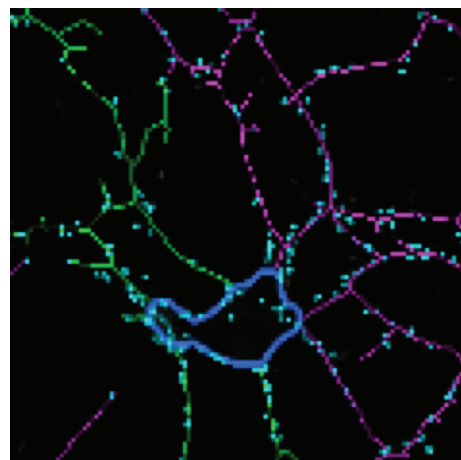
Figure 7. Automated identification of pre- and post-synaptic vesicles stained with Alexa Fluor 594 and Alexa Fluor 647 conjugated secondary antibodies.

From individual cells to phenotypic profiling

Analysis and screening

The CellInsight CX7 LZR High Content Analysis Platform with HCS Studio Cell Analysis Software is a powerful tool for multiple applications. Whether you are analyzing a few slides to answer basic research questions or screening thousands of samples in a systems biology study, the platform of choice remains the same.

• Icon-based guidance, accessible to novice users

• Fully customizable for experienced users

• Thermo Scientific™ BioApplications software tools for assay development and screening

• Scalable to many thousands of images

Always come back to cells

HCS Studio Cell Analysis Software works like you, in the space between image analysis and data-centric analysis, where you can acquire knowledge. All of the cellular features being reported in charts or tables are available for viewing at the touch of a button, so your data are grounded in an understanding of the biology and context (Figure 8).

• Data are seamlessly linked to both images and protocols

• Move from tabulated data to view cells, wells, fields, or plate information

Assay performance

With HCS Studio Cell Analysis Software you can be confident of robust assay performance. Rank your assay parameters based on Z-prime before starting a screen, and then adjust your stopping criteria to collect only the data you need for statistical significance (Figure 9).
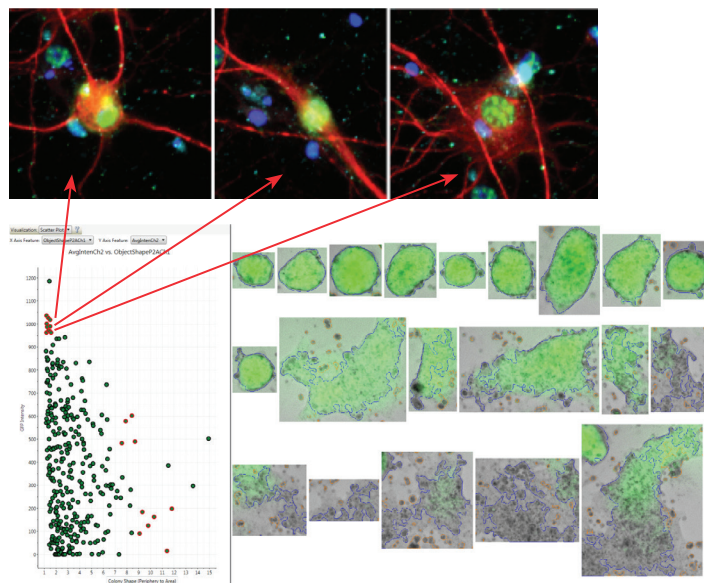

Figure 8. Cell-level data are seamlessly linked to the corresponding images within HCS Studio software, providing scientists with ultimate quality control that biological measurements are indeed occurring in their samples.
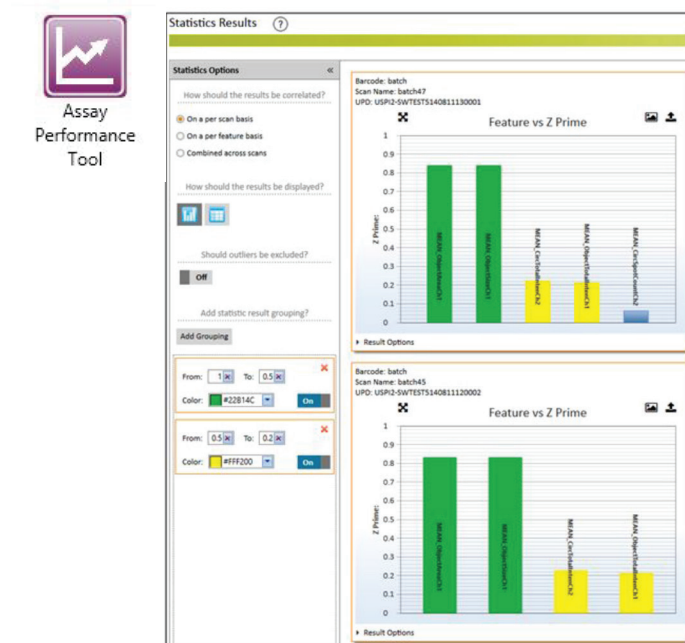

Figure 9. Rapid Z-prime tool to measure assay performance.

Multiplexing reagents for assay optimization

With Thermo Fisher Scientific, you can also draw on the expertise behind Invitrogen™ fluorescent reagents. Since 1975, we have developed and manufactured exquisite fluorescent tools to interrogate the biology of cells. These products have contributed to over 50,000 peer-reviewed publications exploring all aspects of cell biology. When you use Invitrogen™ reagents for HCA you can have confidence in the publications of your peers, and trust in products developed and tested using tools like the ArrayScan and CellInsight High Content Analysis Platforms.

With Invitrogen reagents and the CellInsight CX7 LZR High Content Analysis Platform, you can confidently explore the biology of your cell and tissue models to uncover data that inspire insights and sound decision-making.

Recommended reagents

Drawing on decades of experience in fluorescence imaging, Invitrogen™ HCS reagents (Figures 10–13) are developed using Thermo Scientific™ high content platforms with special consideration for high-throughput workflows and automated imaging:

- Invitrogen™ Alexa Fluor™ conjugated secondary antibodies for brightness and stability

- Invitrogen™ CellMask™ and NuclearMask™ stains for automated demarcation

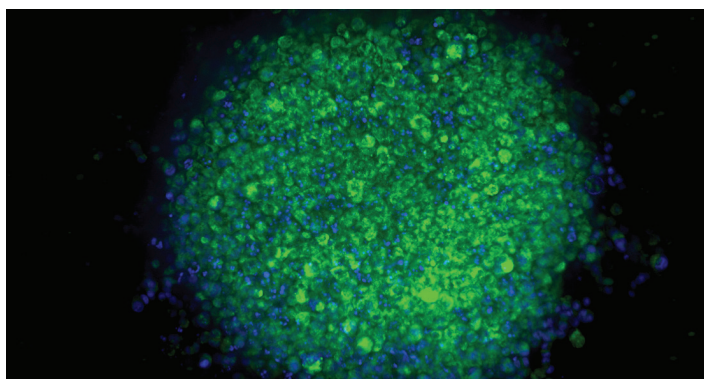- Robust functional probes for cell health interrogation

Figure 10. Confocal image acquired with the CellInsight CX7 platform, of the hypoxic core of an A549 spheroid after staining with Invitrogen™ Image-iT™ Green Hypoxia Reagent.
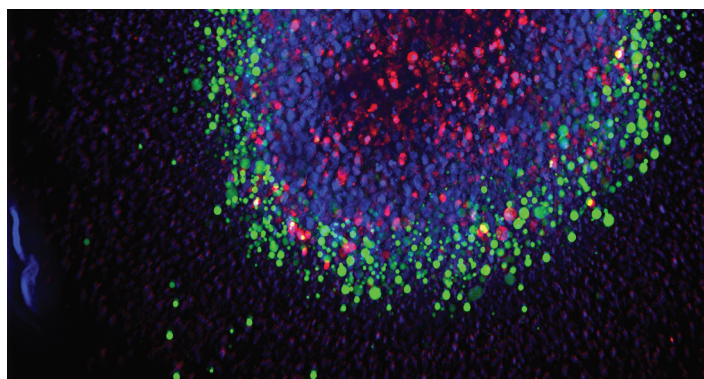

Figure 11. Confocal image acquired with the CellInsight CX7 platform, of a spheroid labeled with Hoechst 33342 stain, calcein AM, and ethidium homodimer.
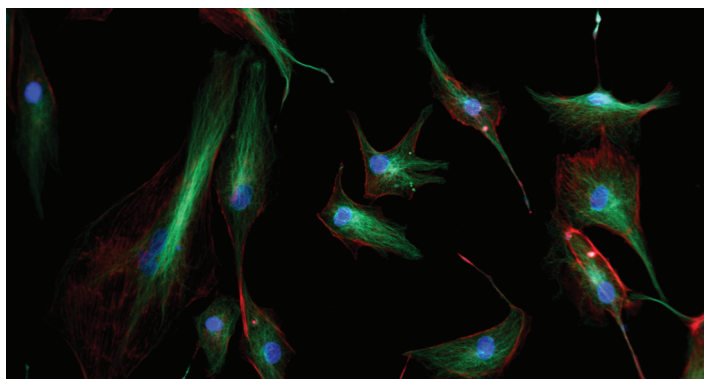

Figure 12. Widefield image acquired with the CellInsight CX7 platform, of cells labeled with DAPI, Alexa Fluor 568 phalloidin, and Alexa Fluor 488 secondary antibody.
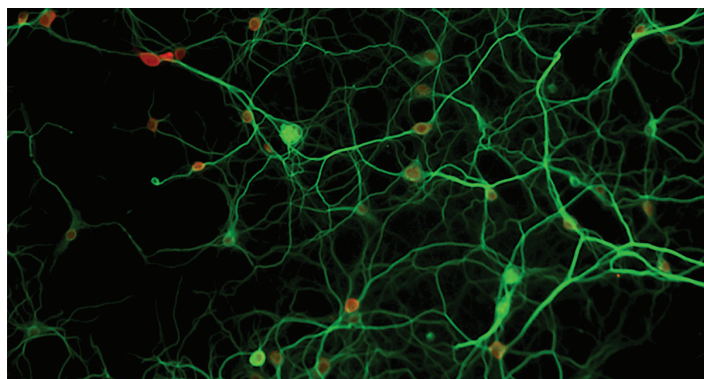

Figure 13. Widefield image acquired with the CellInsight CX7 platform, of hippocampal neurons stained with Alexa Fluor 555 HuC/HuD (cell bodies) and Alexa Fluor 488 MAP2 (neurites) antibodies.

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Ordering information

Product	Cat. No.
Instrument	
CellInsight CX7 LZR High Content Analysis Platform	CX7A1110LZR
CellInsight CX7 LZR High Content Analysis Platform and Store Standard Edition (SE) software	CX7B1112LZR
CellInsight CX7 LZR High Content Analysis Platform with Store Standard Edition (SE) software and Orbitor RS Plate Mover	CX7C1115LZR
Service plan	
AB Protection Plan, CellInsight CX7 LZR reader	ZG30SCCX7LZRREADER
AB Protection Plan, CellInsight CX7 LZR platform	ZG30SCCX7LZRPLTFRM
AB Maintenance Plan, CellInsight CX7 LZR reader	ZG41SCCX7LZRREADER
AB Maintenance Plan, CellInsight CX7 LZR platform	ZG41SCCX7LZRPLTFRM
AB Maintenance Plus Plan, CellInsight CX7 LZR reader	ZG51SCCX7LZRREADER
AB Maintenance Plus Plan, CellInsight CX7 LZR platform	ZG51SCCX7LZRPLTFRM

Find out more at **thermofisher.com/hca**

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