Label-free microscopy with high image quality

CytoSMART® Lux3 BR

Improve your research with high-quality live-cell imaging

Live-cell imaging allows researchers to determine not only whether, but also how and when certain biological events occur in cell culture. In order to achieve the high image quality standards required for data analysis and publications, live-cell imaging is performed predominantly using a microscope with a stage top incubation box. However, the culture conditions in the incubation box are more prone to fluctuations, as compared to a dedicated cell culture incubator. Using the CytoSMART® Lux3 BR, it is no longer necessary to choose between optimal cell culture conditions and image quality.

The CytoSMART® Lux3 BR provides:

+ High-quality images for accurate analyses or scientific publications
+ Integrated image analysis of brightfield confluence and more
+ Time lapse movies to investigate the development of cellular processes
+ Improved research with expanded number of variables for analysis
+ Full remote access allows to inspect cell cultures without entering the lab
+ Small, portable and easy-to-use device

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Applications

Live-cell imaging has become increasingly valuable in the fields of cancer research, drug discovery, immunology, tissue engineering, stem cell research, and 3D cell culture models. Various experimental applications, including cell viability and cell differentiation monitoring, spheroid and organoid characterization, microfluidic chip platforms, cell morphology analysis, single-cell tracking, and angiogenesis monitoring can benefit from detailed kinetic visualization.

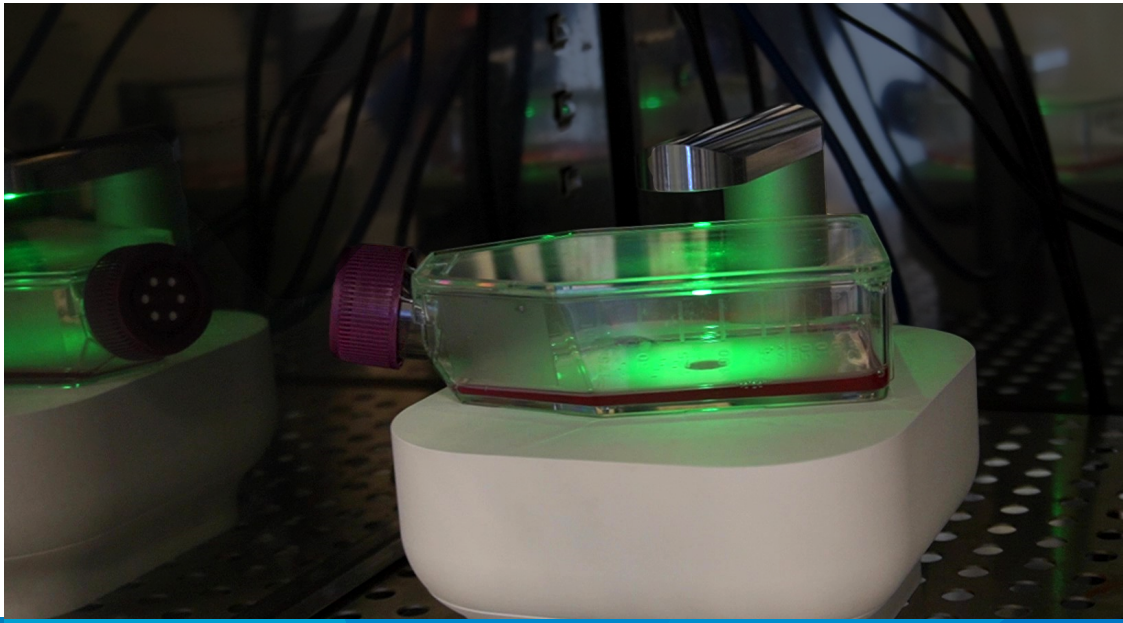
With our cloud-based solution, you have access to the following applications anywhere and anytime you need it:

+ Cell confluence
+ Scratch analysis
+ Colony detection
+ and more

However, you are not limited to these applications or the CytoSMART® image analysis software. All images and movies can be downloaded from the CytoSMART® Cloud environment so you can use other (custom) image analysis algorithms if necessary.

Incubator-friendly live-cell imaging

The cell culture environment inside a stage top incubation box is generally sub-optimal for maintaining live cells. The CytoSMART® Lux3 BR is designed to work inside a standard CO_2 incubator, without disturbing the internal airflow and temperature. This allows you to perform long-term cell imaging experiments under the optimum culture conditions.



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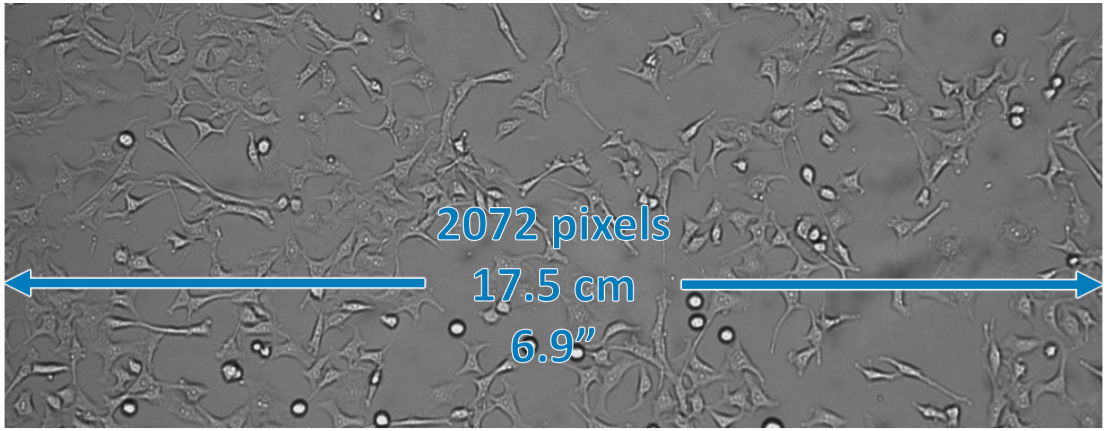
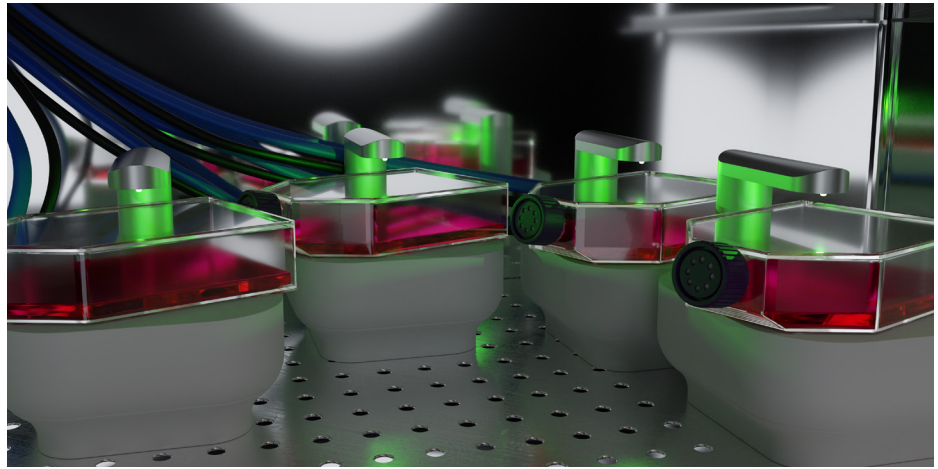
Digital images suitable for scientific publications

The CytoSMART® Lux3 BR is ideal for capturing crisp brightfield images and videos of living cells. The image size of 2072×2072 pixels combined with the 1.45×1.45 mm field of view provide a resolution of 0.7 µm/pixel. Even at the commonly required image resolution of 300 dpi for printed scientific publications, these images can fill the entire page width if desired, without compromising the image quality.



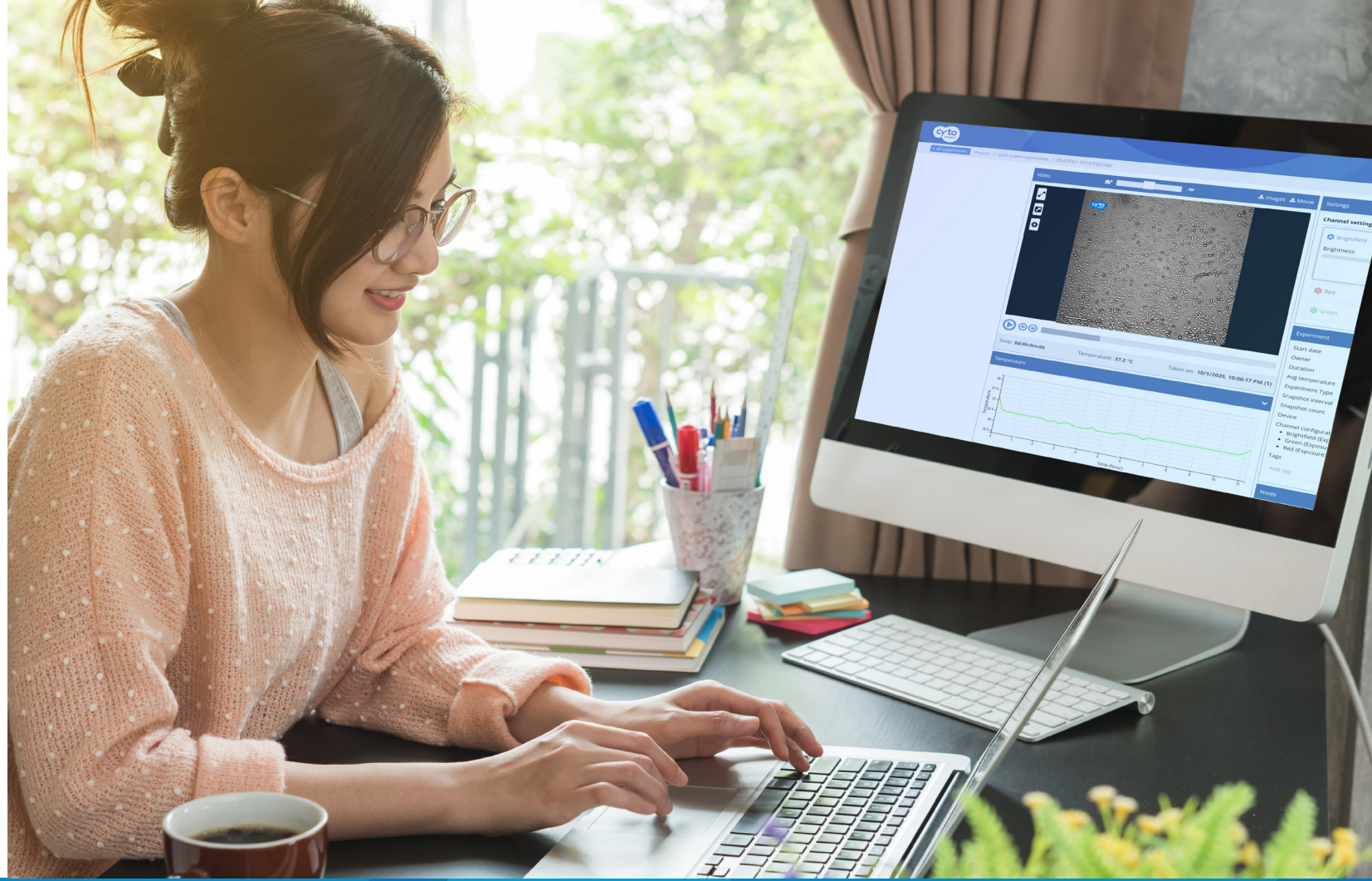
Easy to expand to a multiple-device setup

A setup with the CytoSMART® Lux3 BR can be easily expanded to two or even four devices that can be operated and controlled individually via a single laptop. Since all devices of the CytoSMART® Lux3 BR Duo Kit or Multi Lux3 BR can be placed directly next to each other in the same incubator, the monitored cultures are maintained in an identical culture environment. This facilitates optimal simultaneous comparison of experimental groups, with minimal variations in environmental factors, but also represents a convenient solution for large research groups.



Remote and automated analysis of cell cultures

The CytoSMART® Lux3 BR can be set to record images at specific intervals (between 5 min - 12 h) for minutes, hours and days. In fact, it is one of the few systems that can run for weeks. Images and videos of running or completed experiments can be accessed, processed, and analyzed from any desired location using the CytoSMART® Cloud-based environment. Therefore, cells can be monitored without having to open the incubator, or even be in the lab. The integrated cloud-based image analysis facilitates quantification of output parameters, such as cell confluence or wound healing rate. The automated quantification minimizes avoidable variation and bias in the interpretation of results.



```
"""The setup script."""

from setuptools import setup, find_packages

with open("README.md") as readme_file:
    readme = readme_file.read()

with open("HISTORY.rst") as history_file:
    history = history_file.read()

with open("LICENSE") as license_file:
    license = license_file.read()

requirements = [
    "pillow>=6.2.2, <9",
    "requests>=2.24.0, <3",
    "websocket>=0.2.1, <0.3",
```

Take lab automation a step further

The CytoSMART® Lux3 BR can not only be controlled via the graphical user interface of the app, but also via the CytoSMART® Lux Open API. By adjusting this Python™-based open application programming interface (API) to your lab automation system, you can easily incorporate the CytoSMART® Lux3 BR into your automated setup.

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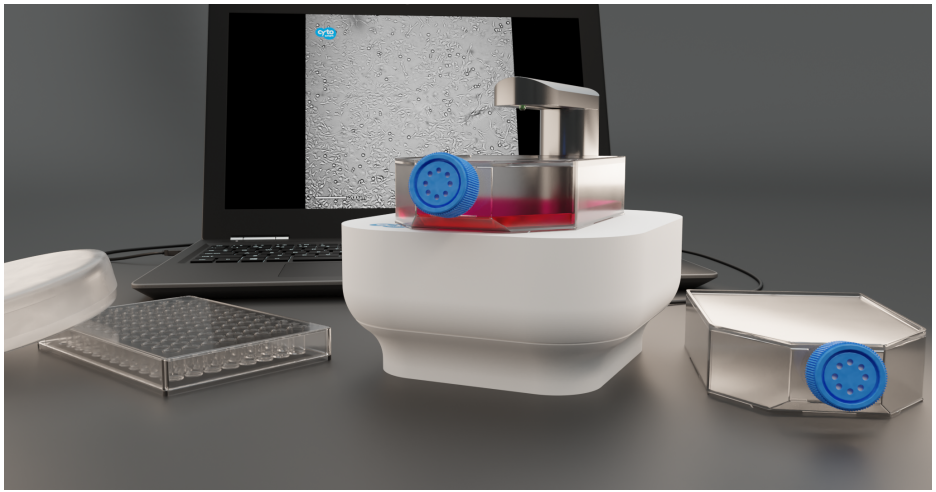
Plates, dishes, flasks or microfluidic chips

The CytoSMART® Lux3 BR can image cells cultured in a wide range of culture vessels including T-flasks, petri dishes, well plates, culture slides, and microfluidic chips. You can simply conduct an experiment in any culture vessel or microfluidic chip.

How to install

1. Place the CytoSMART® Lux3 BR device in the incubator.
2. Connect the device's USB3 cable to your PC or laptop.
3. Start the PC. Download the CytoSMART® Lux3 BR application.
4. Open the app and you are set to go!



Frequently Asked Questions

Q: What is the CytoSMART® Lux3 BR?
A: The CytoSMART® Lux3 BR is an inverted digital microscope that utilizes brightfield and digital phase-contrast microscopy to capture high-quality images of living cells. Due to its compact size, the microscope can be placed directly inside a standard cell culture incubator, allowing to perform long-term imaging experiments without sacrificing cell health and viability.

Q: What are the applications of the CytoSMART® Lux3 BR?
A: The applications of the CytoSMART® Lux3 BR include but not limited to – monitoring cell viability and cell differentiation, spheroid and organoid characterization, cell morphology analysis, and single-cell tracking. Researchers in the fields of drug discovery, immunology, tissue engineering, cancer and stem cell research can benefit from live-cell imaging.

Q: What is the magnification of the CytoSMART® Lux3 BR?
A: The CytoSMART® Lux3 BR comes with a fixed 10× objective and 20× digital zoom.

Q: What image analysis algorithms are available for use?
A: Cell confluence, scratch analysis, and colony detection are currently a part of the image analysis software package. Users always have the option to download raw image data and perform their own analysis.

Q: Do I need to label cells in order to perform image analysis?
A: No, our image analysis algorithms are optimized to be used in label-free screens and assays, so you don't have to add any fluorescent or colorimetric dyes to your culture, providing a non-invasive analysis of the cells.

Q: What culture vessels are compatible with the CytoSMART® Lux3 BR?
A: The CytoSMART® Lux3 BR allows to monitor a wide range of different culture dishes and flasks, including:

- T-flasks: T-25 up to T-250
- Single-well, multi-well plates (6 – 384-well plates)
- Microfluidic chips
- Cell culture tubes
- Petri dishes
- Slides.

Q: Can I specify the recording interval?
A: Images can be recorded at pre-defined intervals. At the start of a new experiment you can specify the interval rate anywhere between 5 min - 12 h.

Q: How do I clean the device?
A: The device is easy to clean using lint-free wipes and 70% ethanol or isopropanol. Do not use acetone to clean the device. Please be aware that the device cannot be autoclaved. After sterilizing with ethanol or isopropanol the device can be used in a cleanroom.

Technical Specifications

Channel	Brightfield, with digital phase contrast
Camera	6.4 MP CMOS
Magnification	10× fixed objective, additional 2× digital zoom
Image size	2072 x 2072 pixels
Field of view	1.45 x 1.45 mm
Light source	LED
Data formats	JPEG, TIFF, XLSX, MP4
Data storage	Unlimited cloud storage
Computer requirements	Windows 10, USB 3.0, internet, 8 GB RAM, 256 GB SSD
Dimensions	166 x 140 x 135 mm (L x W x H)
Weight	1.3 kg
Culture vessels	Well-plates, petri dishes, flasks, microfluidic chips and custom culture vessels
Operating conditions	5-40 °C, 20-95% humidity
Warranty	1 year parts & labor
Extra features	Confluence algorithm, scratch assay analysis algorithm
	Research use only. Not intended for diagnostic purposes.

Ordering Information

Ordering information

at #	Product	Quantity
KAB-1009	CytoSMART® Lux3 BR	1

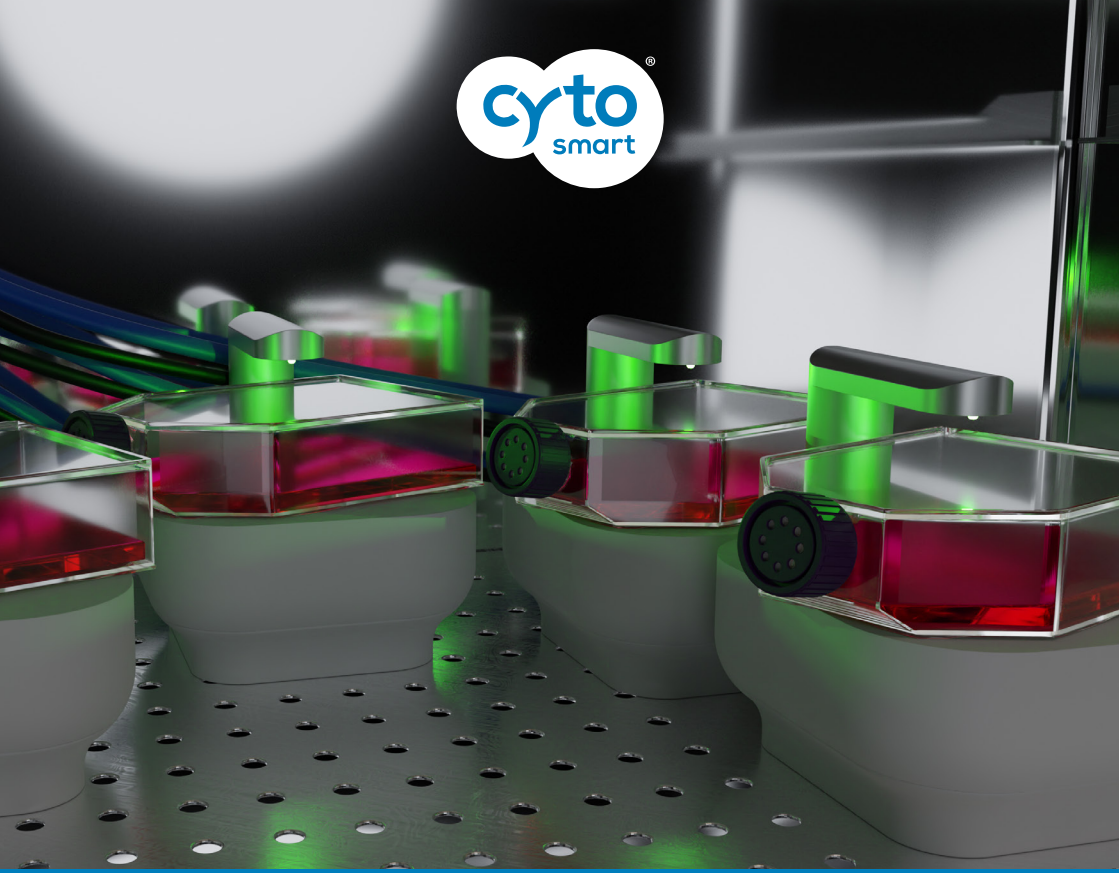
Request quote on www.cytosmart.com

About CytoSMART®

CytoSMART® Technologies is a specialist in development and manufacting of smart microscope systems for life science labs. The company was founded in 2012 by a team of biologists and engineers who were convinced that a new generation of miniaturized microscopes, powered by artificial intelligence for image analysis, would allow biologists to make discoveries more efficiently and at a larger scale.

In 2018 CytoSMART® was selected by Microsoft for its prestigious Scale Up program.

CytoSMART®'s microscopy solutions are used in over a thousand laboratories around the world.



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