

CytoSMART Multi Lux3 FL

Simultaneous monitoring of multiple fluorescence live-cell imaging experiments

Fluorescence live-cell imaging enables researchers to determine not only whether, but also when and how certain cellular events occur in culture. Currently, a fluorescence microscope with a stage-top incubation box to regulate the culture conditions is the most common fluorescence live-cell imaging setup. However, practical issues of this setup exist: the regulation of the culture conditions in the incubation box is more sensitive to variations compared to a dedicated incubator. This variability may disturb the cultures and can distort the results. Besides that, images are only captured at certain time points, but the microscope is unavailable for other users during the intervals between image captures. Using the CytoSMART® Multi Lux3 FL, an automated fluorescence live-cell imaging kit, up to four culture vessels containing fluorescently labeled cells can be imaged simultaneously at regular time intervals throughout the entire culturing period.

The CytoSMART® Multi Lux3 FL can:

Monitor your cells inside the incubator

Usually cells experience an environmental shock when taking them from the incubator for imaging. The devices in the CytoSMART® Multi Lux3 FL are designed to work inside the incubator, without disturbing the temperature and airflow. This prevents fluctuations in temperature or CO₂-level, while it enables you to perform your long-term imaging experiments at the optimum culture conditions for your cells. Follow the intuitive steps of the CytoSMART Multi Lux3 FL app, where up to four devices are controlled by a single laptop. Simply place your culture vessels on the surfaces of the devices, start your experiment and walk away. The images of running or finished 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.

Directly and simultaneously compare experimental groups

Since all devices of the CytoSMART® Multi Lux3 FL 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 variation in environmental factors.

Display the whole picture: brightfield and fluorescence imaging

Clear brightfield as well as green and red fluorescence images can be captured with the CytoSMART® Multi Lux3 FL (see figure 1A-C). This increases the available number of read-out parameters in a single experiment by a factor of three compared to brightfield-only imaging. The monitoring of cultures elucidates the time profile of (fluorescently labeled) cellular events, and thereby shows when and how these events occur.



<https://cytosmart.com/products/cytosmart-multi-lux3fl>

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Quantify cell growth and cell properties

The integrated CytoSMART® Cloud-based image analysis facilitates quantification of a large variety of output parameters. Confluence can be determined for the brightfield channel, as well as the green and red fluorescent channels (see figure 1D-E). Particle count can be performed for the fluorescent channels (see figure 1F). These read-outs can be relevant for e.g., live/dead

staining, cell cycle staining, cell-cell interactions in co-cultures (when a fluorescent label is assigned per cell type), transfection efficiency quantification, and more. The automated quantification – combined with the simultaneous comparison of cultures – minimizes avoidable variation in results.

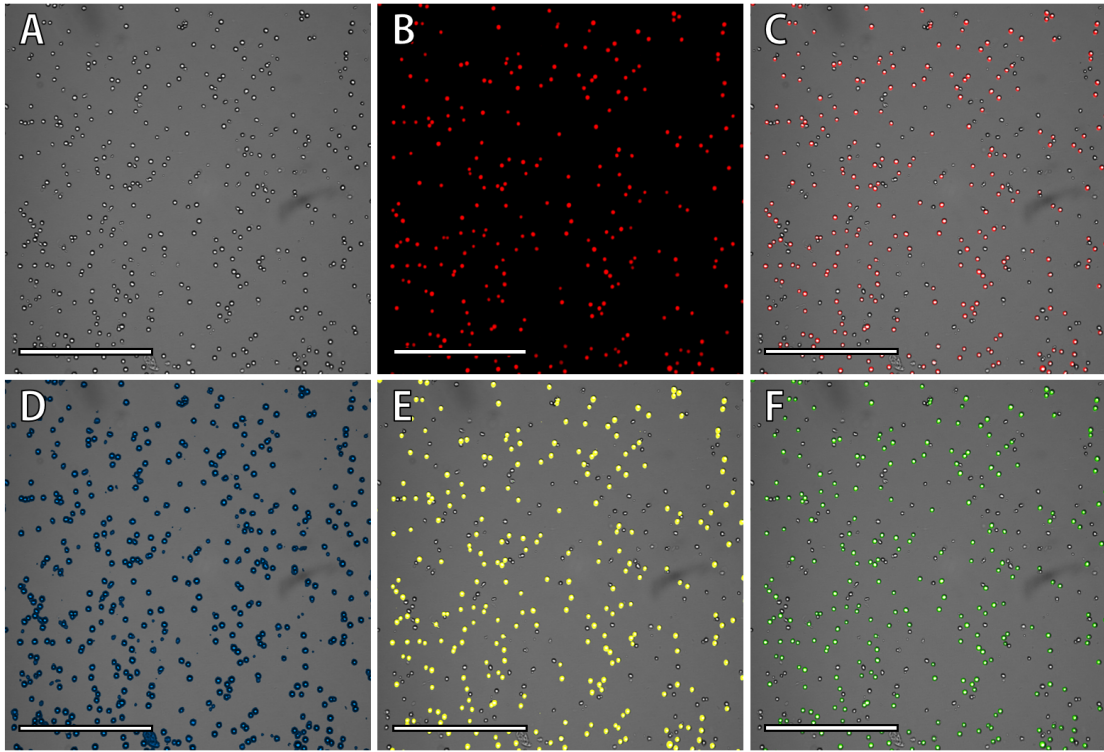


Figure 1.
 A) brightfield channel;
 B) red fluorescent channel;
 C) merged brightfield and red fluorescent channel;
 D) confluence analysis brightfield channel (dark blue);
 E) confluence analysis red fluorescent channel (yellow);
 F) object count red fluorescent channel (green).
 Scale bar: 500 μ m.

CytoSMART® Multi Lux3 FL specifications

No. devices	4
Dimensions (per device)	166 x 140 x 135 mm (L x W x H)
Weight (per device)	1.3 kg
Optics	Brightfield with digital phase contrast; fluorescence module
Magnification	10x fixed objective; additional 2x digital zoom
Brightfield light source	LED
Green fluorescence light source (bandwidth)	LED: 452 nm (45 nm)
Green fluorescence emission filter (bandwidth)	512 nm (23 nm)
Red fluorescence light source (bandwidth)	LED: 561 nm (14 nm)
Red fluorescence emission filter (bandwidth)	630 nm (90 nm)
Camera	6.4 MP CMOS
Field of view (per device)	1.45 x 1.45 mm; 2072 x 2072 pixels
Resolution	0.7 μ m/pixel
Output options	Raw images (.jpg), processed images (.jpg, .tiff), processed videos (.mp4), processed data (.xlsx)
Well-plate types	6-384 well-plates (one fixed field of view per device)
Culture flask types	HYPERflask, T25-T225 and triple flasks (one fixed field of view per device)
Other culture vessels	Petri dish, any transparent vessel <55 mm high (one fixed field of view per device)
Operating environment	5-40 °C, 20-95% humidity



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