

CytoSMART Lux3 FL Duo Kit

Fluorescence live-cell imaging for side-by-side comparison studies

The CytoSMART Lux3 FL Duo Kit is an automated fluorescence live-cell imaging system for long-term side-by-side comparison studies, that fits in a standard cell culture incubator. The two devices are controlled by a single laptop, and the red and green fluorescent channels increase the number of read-out parameters per experiment. Images of running or finished experiments can be accessed, processed and analyzed from any desired location using the CytoSMART cloud-based environment.

Simultaneous fluorescence live-cell imaging: monitoring, comparison and analysis

Using fluorescence live-cell imaging, researchers can determine whether, when and how certain cellular events occur in culture. The CytoSMART Lux3 FL Duo Kit additionally facilitates long-term side-by-side comparison of two experimental conditions. Integrated image analysis in the CytoSMART cloud facilitates quantification of output parameters such as (fluorescent) confluence, fluorescent object number and more.

Application example: Side-by-side comparison of confluence per cell type in co-cultures

Fluorescence live-cell imaging with the CytoSMART Lux3 FL Duo Kit enables distinction of cell types in a co-culture, when each cell type is assigned a specific fluorescent label. This can elucidate interactions between cell types, which can be relevant for e.g. cancer research, where enhanced proliferation or competing cell types influence tumor growth.

Figure 1 displays two co-cultures of tFP602-labeled MDA-MB-231 cells (red fluorescent) with non-fluorescent 3T3 cells, at equal (1:1) or skewed (1:10) seeding densities. In both co-cultures, total confluence as well as confluence per cell type was determined over time. This revealed competition between the cell types, where the 3T3 cells largely eliminated the MDA-MB-231 cells at the skewed seeding density, and proliferation of both cell types was low at the equal seeding density.

Long-term fluorescence imaging in an incubator

With the CytoSMART Lux3 FL Duo Kit, two simultaneous fluorescence live-cell imaging experiments can be compared over days or weeks under identical conditions. During the entire experiment, the cultures can be continuously maintained in the CO₂ incubator or hypoxia chamber, without required manual intervention. This provides an ideal and consistent culture environment, opposed to the generally sub-optimal conditions inside an incubation box of a benchtop fluorescence microscope.

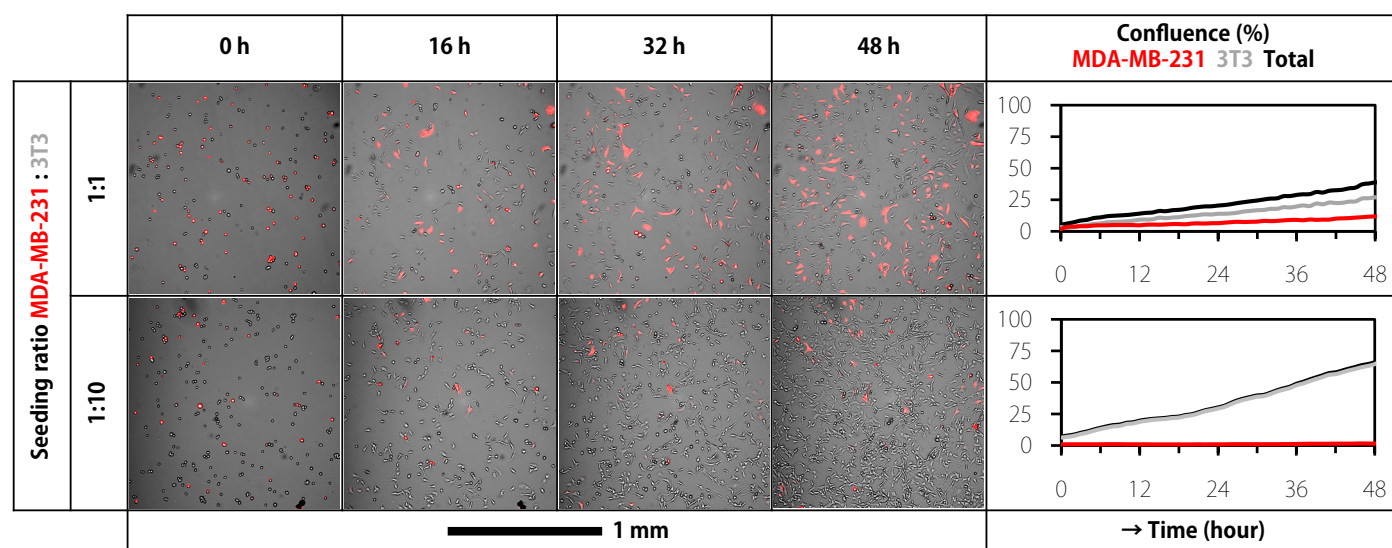


Figure 1. Side-by-side comparison of confluence per cell type in co-cultures. Red fluorescent MDA-MB-231 cells and non-fluorescent 3T3 fibroblasts were seeded at 1:1 or 1:10 ratio, and imaged every 1 h during 48 h. Confluence per cell type was determined from confluence per imaging channel.