

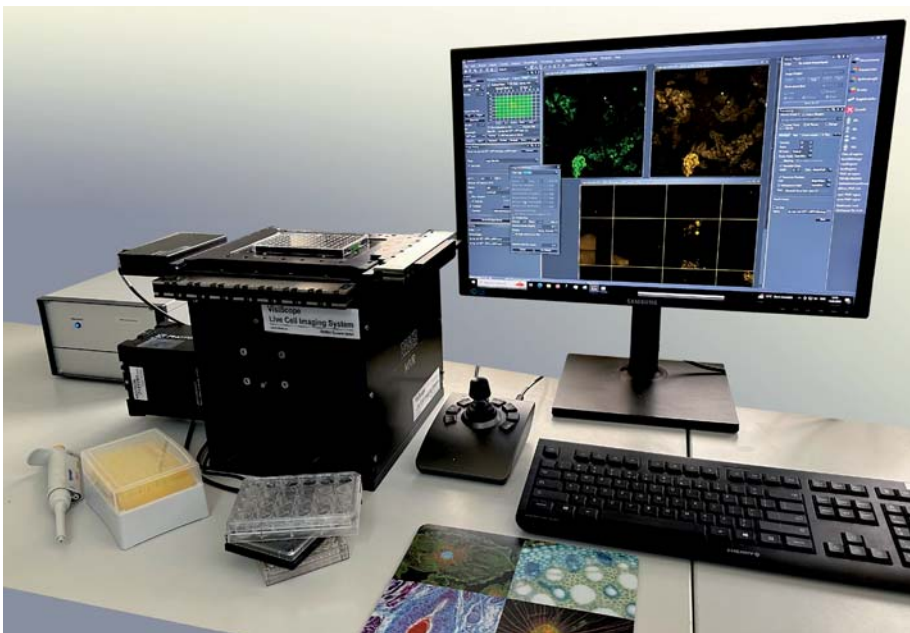
VisiScope Cell Analyzer

Multidimensional Cell Based Imaging System

The use of microscopy and fluorescence imaging in science is one of the most important technologies to analyze structure and fundamental function in cells. Genetic engineering with GFP derivates the investigation of living cells in more details about localization and temporal depending functions. For this detailed analysis a high throughput of samples with biological assays is required to get the best possible statistically accurate results.

VisiScope Cell- Analyzer

Cell Based Screening System



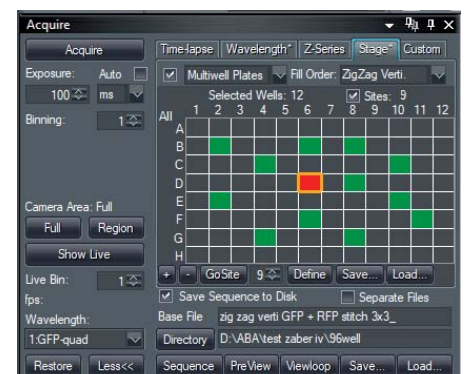
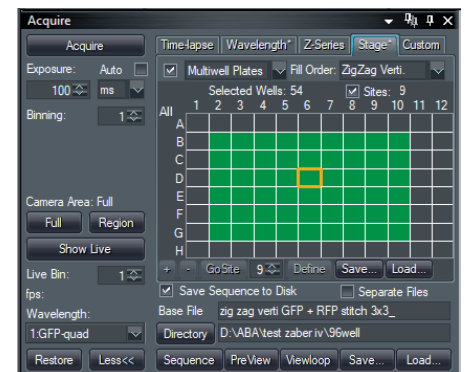
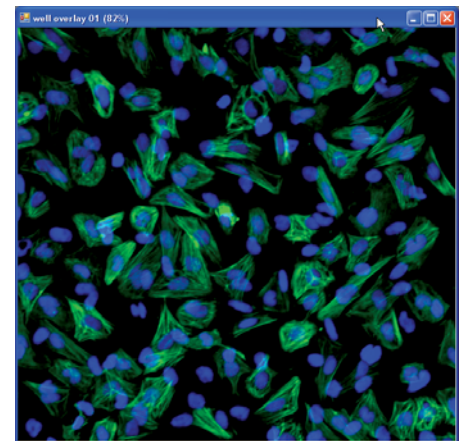
VisiScope Cell Analyzer example based on ZABER MVR fully motorized microscope with ultra fast XY scanning stage and 96-well plate.

Control and Visibility

VisiScope makes intracellular metabolism visible and allows quantification of it. The VisiView® software controls all motorized microscope components and synchronizes image acquisition. The analyzed images and measurement header information can be stored in database format.

VisiView® Screening Option

On-line multi color imaging with automatic color detection and overlay of up to seven fluorescent channels per well gives the user a high flexibility in cellular research. The VisiView® software helps with easy device control and intuitive handling of the software. The macro interpreter language covers all functions for one-click automation of processes / experiments.



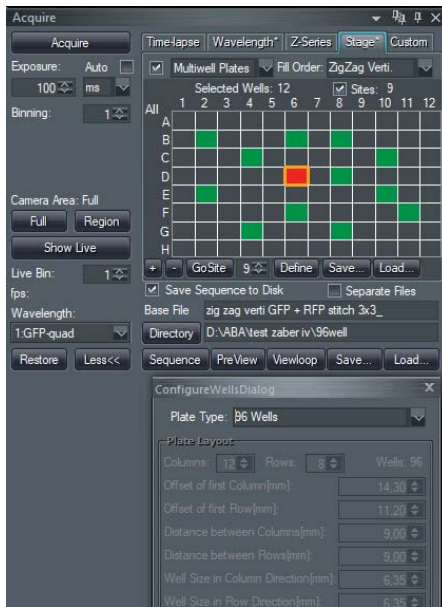
VisiView screening dialog with selection for scanned wells.

VisiScope Cell- Analyzer

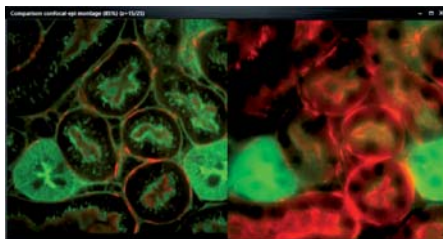
with Spinning Disk
Option

VisiScope Cell Analyzer with Spinning Disk Confocal Combination

Provides increased sensitivity and resolution by best optics, objectives, spinning disk confocal, high-powered laser illumination and backilluminated sCMOS cameras. Spinning Disk Technology includes simple and user-defined configuration to ensure maximum assay performance for both confocal and widefield microscopy imaging.



VisiViw Screening acquisition software



Comparison of widefield and spinning disk confocal image

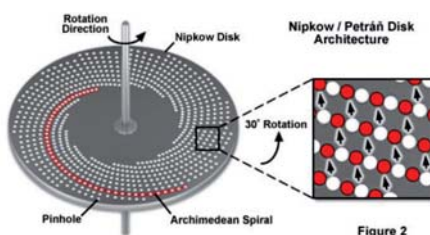


Figure 2

Used Spinning Disk Nipkow principle



VisiScope Cell Analyzer based on ZABER MVR microscope and Crest CICERO Spinning Disk Confocal

Widefield and Spinning Disk Confocal Imaging

The CICERO is a complete Widefield (WF) and Spinning Disk Confocal (CF) solution that can be integrated into any imaging setup, transforming it into an intuitive and reliable confocal system. Life sciences disciplines relying increasingly on high-resolution 3D imaging.

Reliable and user-friendly solution by using multimode Laser as illumination sources. The wide spectral range enables a large variety of applications.

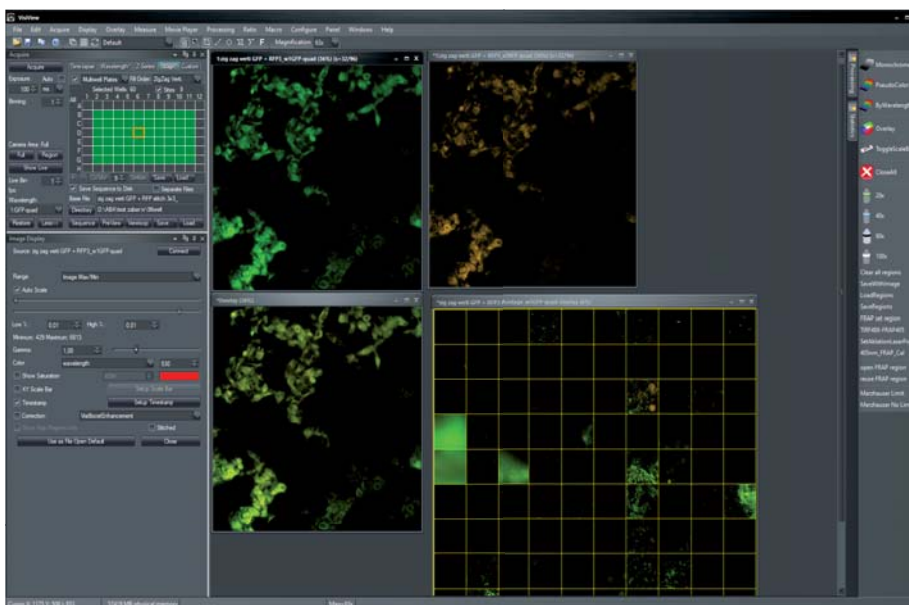
High-speed Spinning Disk Confocal imaging with up to 22 mm FOV. With its small footprint, the CICERO delivers fast image acquisition speed (15K rpm) and sensitivity, easily enabling live cell imaging and large-scale 3D object imaging. Due to its large field of view (FOV), the CICERO offers a minimal scanning process and can capture large samples in a single frame.

VisiScope Cell Analyzer

The VisiScope Cell Analyzer is designed as a multi-dimensional cell based imaging system. The cells are cultivated in multiwell culture plates e.g. 96, 384 or 1536 well format. The cells are labeled with different fluorochromes for each cell component. With addition of e.g. inhibitory substances, the expression of the labeled components will be increased or decreased.

VisiScope Cell- Analyzer

Cell Based
 Screening
 System



VisiView screening software module for multi-well scanning.

System Components

- » High-end Zeiss, Leica, Nikon, Olympus or openFrame microscope with excellent optical and motorized components
- » Objectives 5x; 10x; 20x; 40x ; 60x and 100x
- » High resolution digital scientific camera with best sensitivity and cooling
- » High speed and accurate motorized XY- or XYZ-stage
- » Powerful PC computer system
- » VisiView® imaging software for full motorized control of all components
- » Optional: hardware autofocus system, closed incubation system

System Speed Specification

- » Scanning time 96 well one wavelength based on magnetic DC stage below 1 minute and for two wavelengths about 1,5 minutes
- » Stage specification: 750 mm/sec; 500 nm repeatability and 50 nm minimum incremental move



VisiScope Cell Analyzer based on Zeiss Axio-Observer microscope



VisiScope Cell Analyzer based on Leica DMI microscope

VisiScope Cell- Analyzer Incubation Option

Cells Need Perfect Climate Conditions!

The VisiScope Cell Analyzer Incubation System

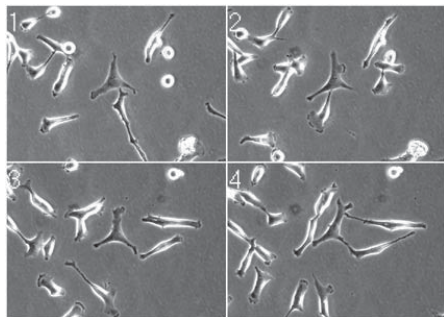
The large incubation chambers is a high performance solution for live cell applications over long time periods which are conducted at a constant temperature for the entire observation. It keeps highly stabilized conditions after a warm-up phase of the internal components e.g. slide holder, objectives. CO₂ and O₂ tightly controlled, too.



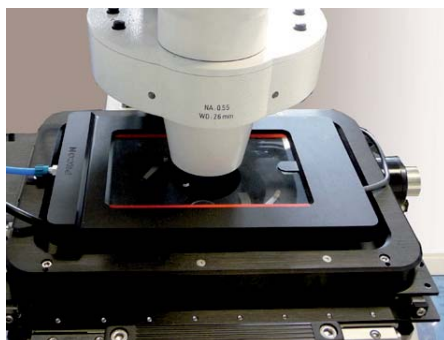
Multiwell insert M96-S.



Example of Okolab incubation chamber or heating stage insert with CO₂ control option



Time lapse of HeLa cells



Stage incubation insert with heating universal Labtek holder and heating CO₂ cover

CO₂ and O₂ Modules

CO₂ and O₂ modules can be easily added with suitable CO₂ cover for corresponding sample holder e.g. for multiplates or universal slide holder. A O₂ controller controls the oxygen concentration besides the control of temperature and CO₂-concentration. The O₂ content is reduced by displacement with nitrogen. Within the system, the O₂-concentration is monitored by a zirconiumoxide sensor, an analogue PID closed loop control adds nitrogen via a piezo controlled valve into the circulating air stream. This continuous nitrogen flow gives a very homogeneous oxygen distribution with best control tolerances.

Objective and Mounting Frame Heater

Especially with the use of oil immersion objectives, the direct contact between the cell cultivation vessel and the colder objective leads to a significant cooling in the area of the observed cells. The Objective Heater is designed for stable heating of microscope objectives in order to improve temperature conditions in the observation area. The heatable mounting frame with circular and slotted cut-outs, can be easy installed at the microscope stage insert with an opening of 160x110 mm. The base plate is directly heated from below. The frame has been specifically developed for CO₂-gassing together with a CO₂-Cover.