2D-VisiFRAP Realtime Scanner

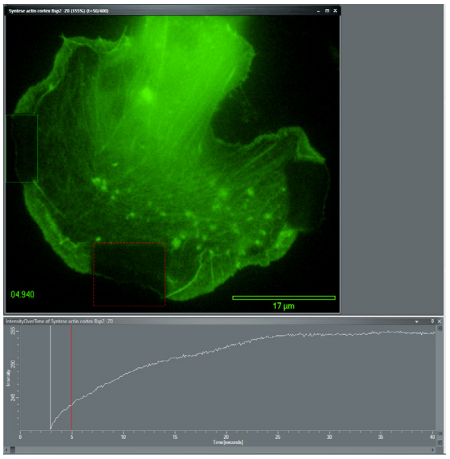
With unlimited number and size of regions and with auto-calibration

Photo-Bleaching and Photo-Activation are well established fluorescence imaging techniques for photo manipulation. A laser beam is used to perform photo bleaching or activation in user defined free selectable regions, lines or dots. The 2D-galvanometer scan head can easily be used on the standard epi illumination port of the microscope.

VisiFRAP
2D Scanner

FRAP
PA

Zeiss Axio-Observer microscope with VisiFRAP-2D Scanner



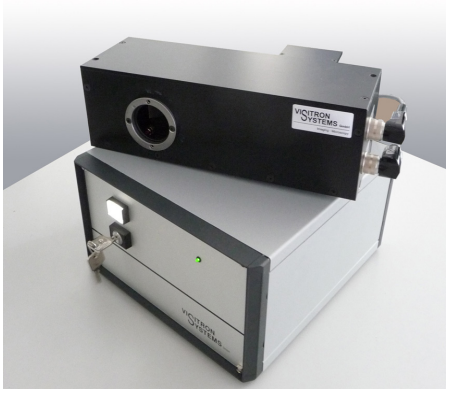
Actin polymerization of Melanoma cells.
Image courtesy of Prof. Rottner,
University of Bonn

FRAP on the fly

The optimised system components allow simultaneous FRAP and imaging at single mouse click on any position in the sample FOV. This new feature in the VisiView FRAP software is minimising any loss of temporal information and shows the flexibility and high speed positioning of the VS-FRAP scanner. The “FRAP on the fly” meets perfectly the major demand in FRAP experiments.

Auto-Calibration

With the automatic signal and spot detection of our VisiView imaging software, the auto-calibration algorithm calibrates the FRAP scanner. It shows the laser spot in several regions on the display and the accuracy of the calibration. This tool makes it easy to use different objectives and filters. It saves time and improves your work.



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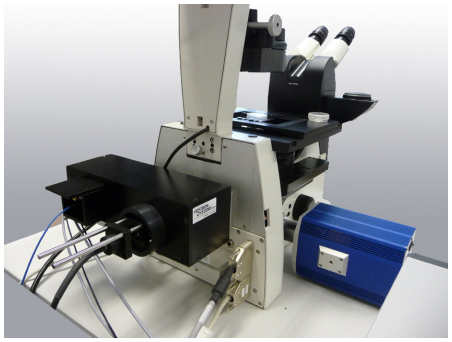
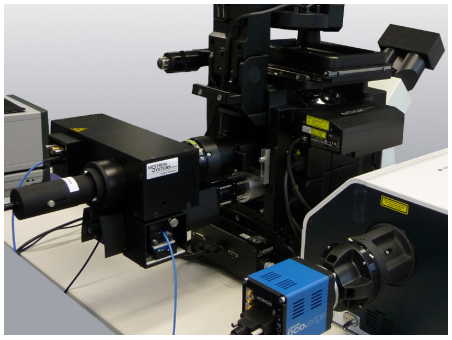
PA Photoactivation Application

Photoactivatable fluorescent proteins represent an innovative tool for the direct observation of time dependent molecular events in living cells. The possibility of switching on a selected and confined subset of the expressed target proteins allows to follow biological processes reaching high signal to noise ratios.
With the VisiFRAP scanner flexible ROI can selected for e.g. PA GFP activation. The invasion can be controlled and observed by quick movie - timelapse acquisiton and display.

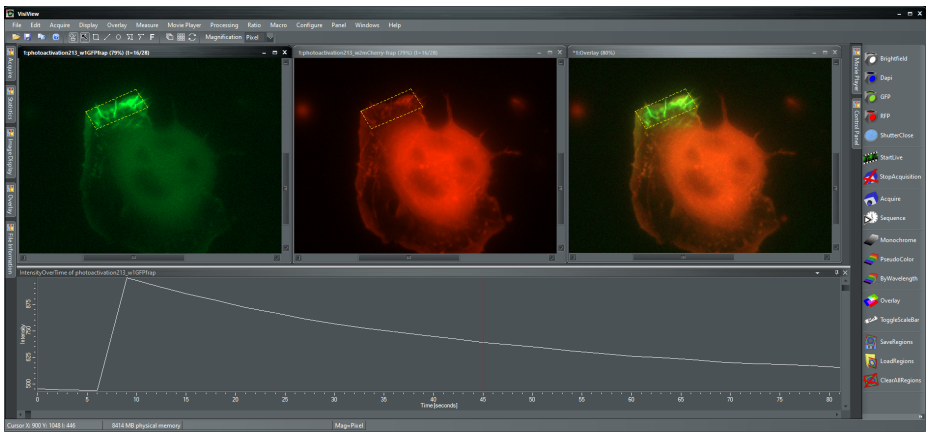


Leica DMi microscope with VisiFRAP-2D scanner and Coolsnap-HQ camera



Olympus-IX83 dual deck with VisiFRAP-2D scanner and VisiTIRF

Zeiiss Axi-Examiner upright microscope with VisiFRAP-2D scanner



VisiView shows acquired Hela cells with PA-GFP link to actin filaments

FRAP and PA Microscopy Detection

Fluorescence recovery after photobleaching (FRAP) microscopy has been widely used to study the diffusion, binding and transport of biomolecules in living cells. With the advance of photoswitchable fluorochromes, the same instrumentation can now be used to photoactivate molecules of interest.
To allow the capture of rapidly changing phenomena, it is important to use a detector that offers high quantum efficiency, such as an EMCCD or sCMOS-BI camera. If required, these detectors can yield millisecond time resolution at single-photon sensitivity, clearly outperforming conventional CCD detectors.

Features:

- Support for all microscope brands: Zeiss, Leica, Nikon, Olympus
- Intensity modulation: 0-100%
- Scanning speed: 1 kHz rate
- Dwell time control: from 1ms to seconds
- Fiber inputs: single mode fiber, FC/PC
- Wavelength range: standard 400-700nm
- Mulit-ROI: unlimited number of regions
- Live mode
- Communication: USB2.0

VisiView® FRAP - Software Module

Easy to use FRAP Scanner

The VisiView® FRAP option in conjunction with the 2D-VisiFRAP gives you control over high power lasers, which are focused down to the µm-scale. The co-evolution of Software and 2D-VisiFRAP results in a perfect interplay and high time resolution when switching lasers. Moreover, flexible ROI selection and fast laser deflection provide the freedom to specifically excite multiple parts of your sample almost at once.

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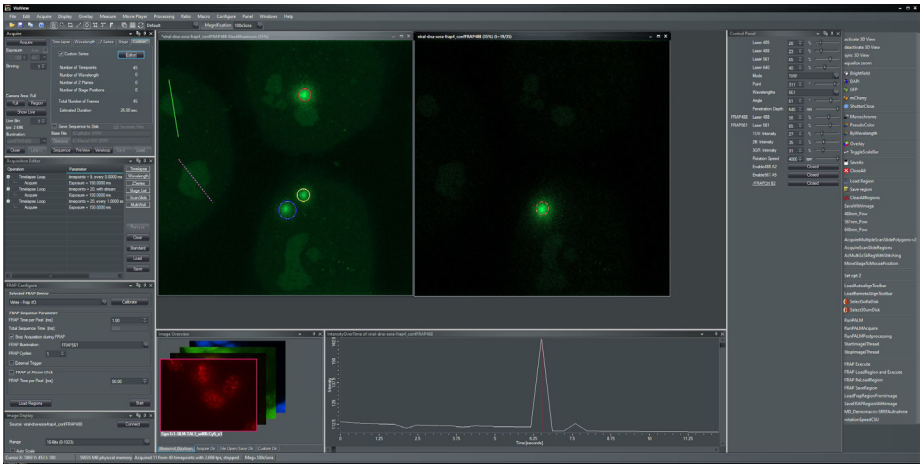
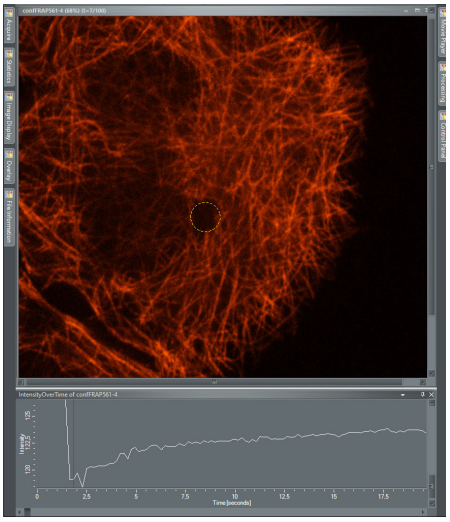
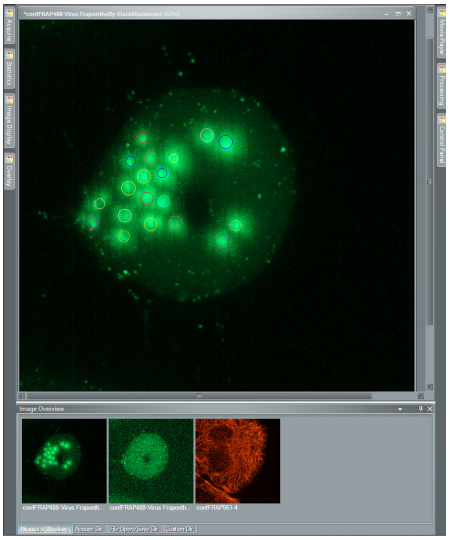


VisiView acquired COS cells with 405nm laser in frap on the fly mode



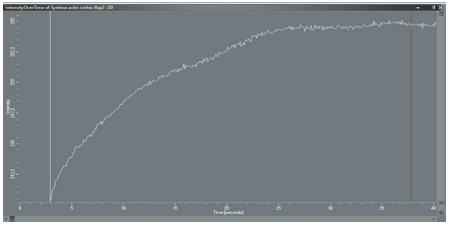
FRAP Acquisition Dialog

The FRAP configuration dialog is directly accessible from the time lapse tab of the clear-cut VisiView acquire dialog. It gives you control over FRAP parameters as well as access to the simple auto-calibration procedure. Further, you can easily test the FRAP parameters using a live preview before you start the real experiment.



FRAP on the Fly Function

For fast kinetics, FRAP on the Fly mode can be used. During the acquisition sequence e.g. cells can be laser activated by clicking with the mouse pointer within the image and can be recorded in Real-Time.



VisiFRAP typical Applications:

- Cell membrane analysis
- Monitoring of surface trafficking
- Nucleocytoplasmic shuttling
- Protein diffusion studies
- Region-specific Photoactivation
- Acceptor photobleaching
- Photoconversion studies