

Living up to Life



The screenshot displays the Leica HyD SMD software interface. On the left, a list of detector channels is visible. The main window is divided into several sections: 'Shifts' and 'Fast Recording Parameters' at the top; 'Measuring Settings' in the middle, including 'TCSPC Settings' (Resolution: 18.0 ps, Mode: T2, T2) and 'SensuChan' (WI Channel 1); and 'TCSPC Histogram' at the bottom. Three plots are shown: a correlation plot with a flat top, a steep decay plot, and a histogram plot. The correlation plot has the text 'Flatness – excellent for mathematical methods. Get the best fit possible.' The steep decay plot has the text 'Steepness – look on very fast processes.'



# In a Class of Its Own Leica HyD SMD

High Precision Detector for FCS, FLIM, FLCS,  
and Super-Sensitive Imaging

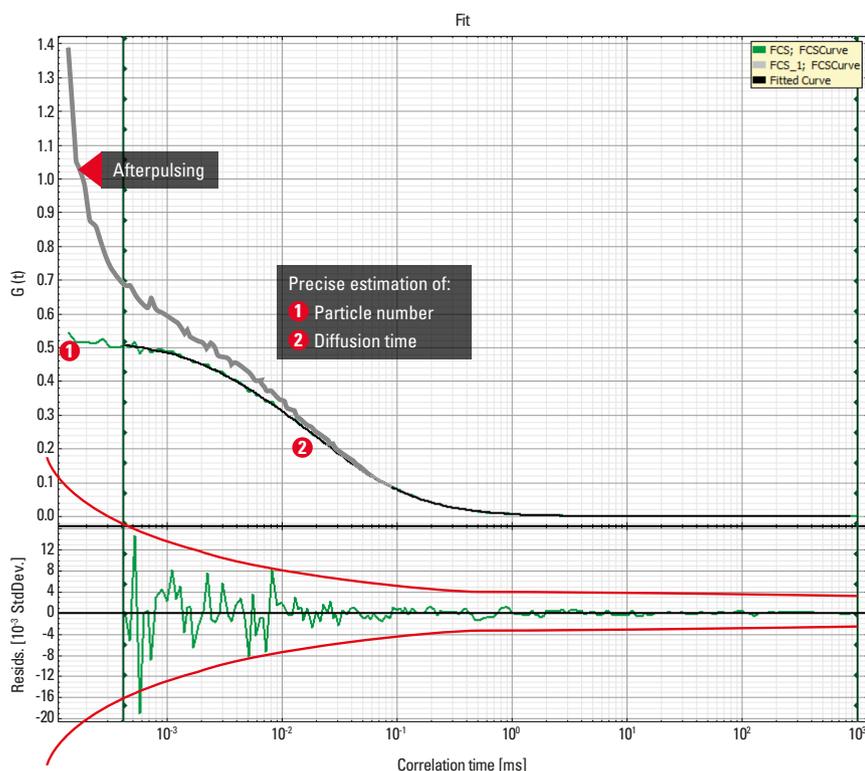
# Maximum Precision for Reliable Data

Highest precision for FCS, super-fast response for FLIM, unparalleled dynamic range for brilliant images – with the universal Leica HyD SMD you can do both quantitative SMD(Single Molecule Detection) measurement and imaging alike. Integrated into the Leica SP detection system, it covers all applications from FLIM (Fluorescence Lifetime Imaging), FCS (Fluorescence Correlation Spectroscopy) or combined methods like FLCS (Fluorescence Lifetime Correlation Spectroscopy) to advanced confocal imaging. Its additional external cooling extremely decreases dark-noise. Especially developed to serve all your needs, the Leica HyD SMD is truly in **a class of its own**.

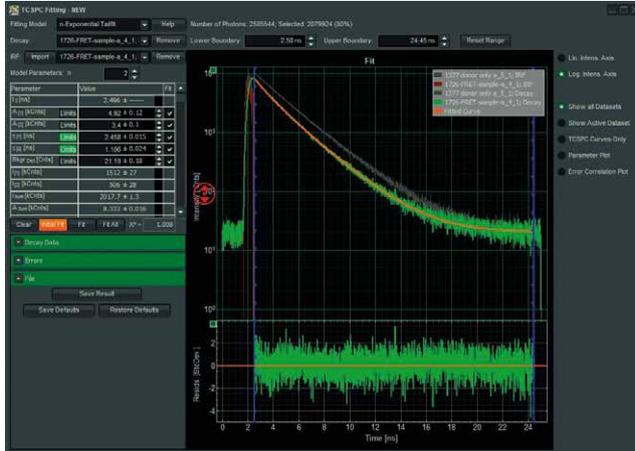
## ACCURATE MEASUREMENT OF CONCENTRATIONS

The Leica HyD SMD has virtually no detector after pulsing. The flat plateau of the FCS curve allows you to perform precise measurements of particle numbers and diffusion time. No oscillation in the residuum curve indicates optimal fit quality of

your data. Optimized detection range reduces photobleaching and artefacts in FCS curves and minimizes crosstalk in cross-correlation experiments. Trust in your high-quality FCS data with the Leica HyD SMD!



FCS curve acquired with HyD SMD (green) and Avalanche photodiode (grey).  
Sample: 10 nM Alexa 488 in water.  
The plateau in the microseconds area allows precise estimation of particle concentration. The residuum (green) indicates optimal fit quality.  
Particle number:  $n = 2.3$ ,  
Diffusion time:  $\tau = 24 \mu\text{s}$ .



FLIM-FRET experiment: HeLa cells stained with mGFP (donor only – gray) or mGFP-mCherry (FRET-green). Lifetime measurements:  $\tau_{\text{Donor}} = 2.5$  ns,  $\tau_{\text{FRET}} = 1.2$  ns reflects 52 % FRET efficiency. Sample courtesy of Dr. Joel Beaudouin, Bioquant Heidelberg, Germany.

## LOOK AT THE FASTEST PROCESSES

The instrument response time of the Leica HyD SMD is incredibly short. This means you can use dyes with short lifetimes for your FLIM measurements to observe ultrafast biological processes. Its high quantum efficiency yields exact FLIM data from weak signals. Quantitative binding data from your FLIM FRET experiments is more precise than ever.

## ULTIMATE FLEXIBILITY

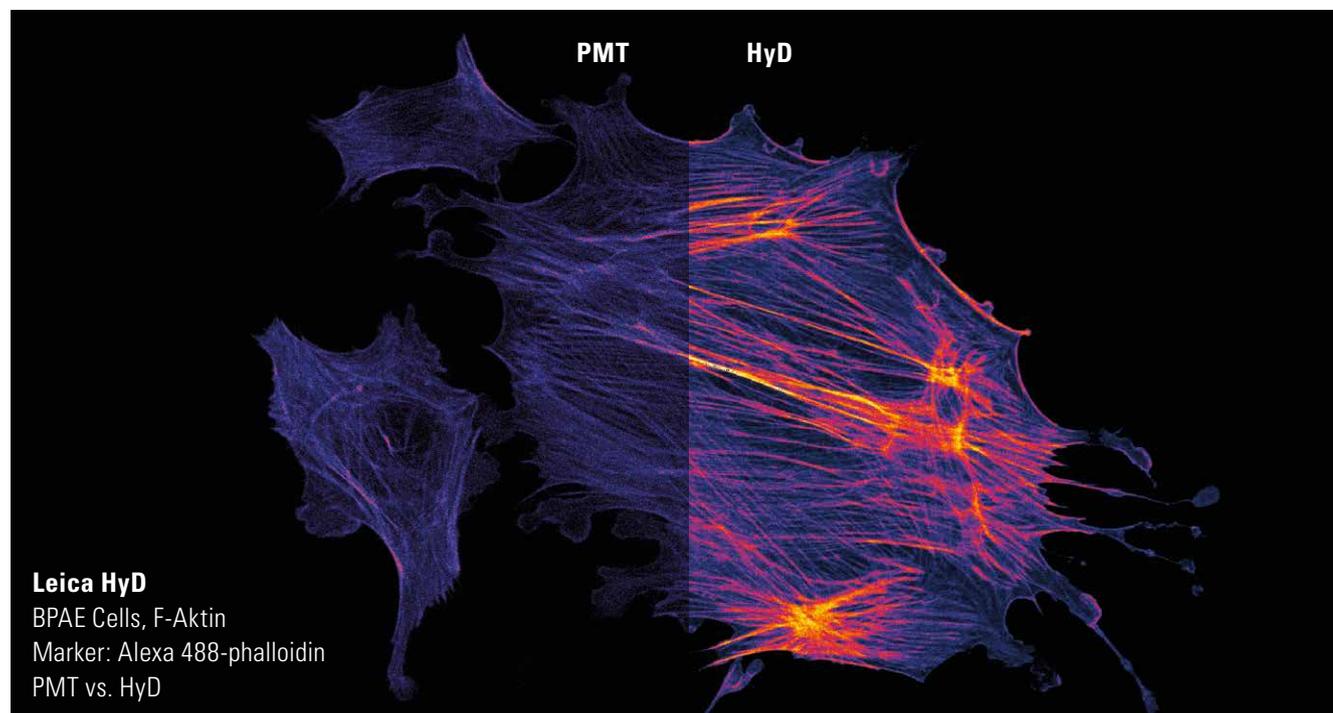
Do you need UV excitation or even the most flexible white light laser for your experiments? With the Leica HyD SMD in descanned position you can use any available light source for your experiments and your system spectrally adapts to dye emission. The detector is not fiber-coupled, which means a tremendously improved transmission compared to other types of coupling. Every photon counts: By performing spectral FCS and FLIM measurements you can find the optimal imaging condition for your experiment. Do SMD without crosstalk and with excellent signal-to-noise ratio!



User interface for spectral excitation-emission FCS or FLIM scan. Find the optimal setting for your dye.

## SUPERIOR CHARACTERISTICS THAT STRENGTHEN YOUR SCIENCE

- › Precise fluorescence lifetime data
- › Correct FCS data interpretation
- › New applications: multi-spectral FCS, FLIM and FLCS
- › Optimal adaption of F(L)CS and FLIM detection to the sample
- › Excellent SNR
- › Suitable for gated imaging and gSTED
- › One detector for multiple applications saves money and makes your results more comparable



**Leica HyD**  
BPAC Cells, F-Aktin  
Marker: Alexa 488-phalloidin  
PMT vs. HyD

**NOT JUST QUANTITATIVE DATA, BRILLIANT IMAGES TOO!**

The Leica HyD SMD is not just a dedicated detector for specific applications. You can use the Leica HyD SMD for advanced confocal imaging, too. Its superior sensitivity and large dynamic range combined with rapid detection speed and low dark noise make it the ideal detector for all specimen.

- › Improve your image contrast through low dark noise.
- › Image bright and dim structures simultaneously due to high dynamic range.
- › Reduce light dosage and bleaching with the Leica HyD's extreme sensitivity.
- › Observe fast live cell dynamics with high detector efficiency and fast sampling rate combined with the high speed tandem scanner.
- › Make photon counting the standard with everyday samples by ultra-short pulses and rapid sampling.
- › Get brilliant, publication-ready images that convey every detail with unprecedented fidelity.

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**LASER RADIATION**  
VISIBLE AND INVISIBLE - CLASS 3B  
AVOID DIRECT EXPOSURE TO BEAM  
< 500mW 350-700nm  
IEC 60825-1: 2007

**LASER RADIATION**  
VISIBLE AND INVISIBLE - CLASS 4  
AVOID EYE OR SKIN EXPOSURE TO  
DIRECT OR SCATTERED RADIATION  
P<4W 350-1600nm >80fs  
IEC 60825-1: 2007