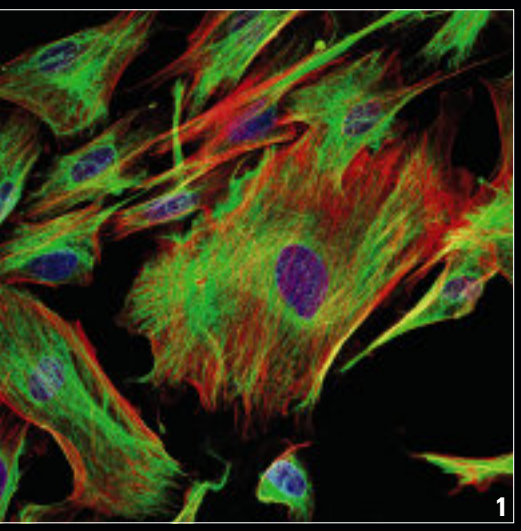
Spectacular Imaging!

Leica TCS SPE: High Resolution Spectral Confocal

Affordable Excellence for Your Daily Research

Leica

MICROSYSTEMS



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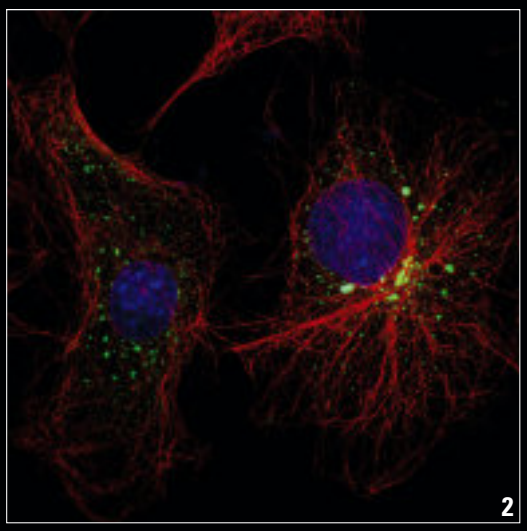

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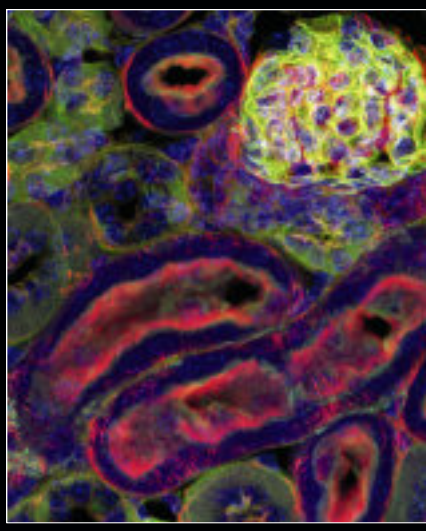
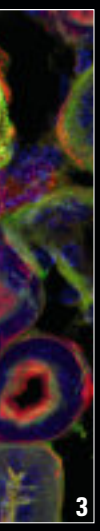


- Spectacular Imaging
- Easy to Achieve
- A Reliable System
- Affordable Excellence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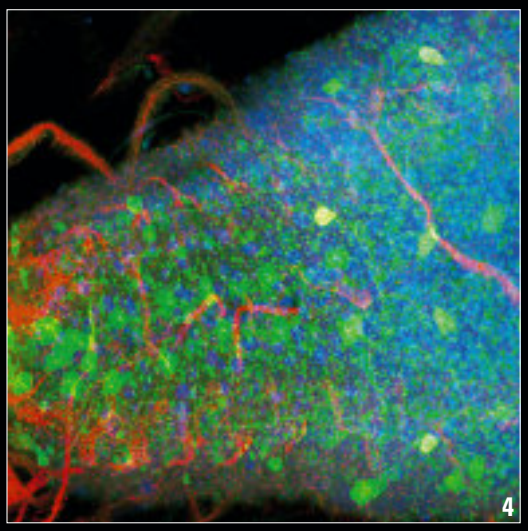
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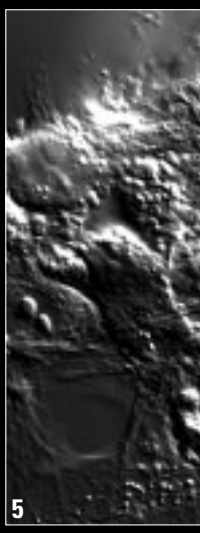
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Confocal microscopy applications have increased greatly in the last decade, and high quality fluorescent images have been an important key to new discoveries. In addition, clinical, pharmaceutical and biotechnological research shows a growing demand for high-resolution 3D images. Confocal systems offer the advantage of the best image quality, but most instruments currently offered still require intensive training before they can be usefully operated. They also need specific room conditions not found in every facility.

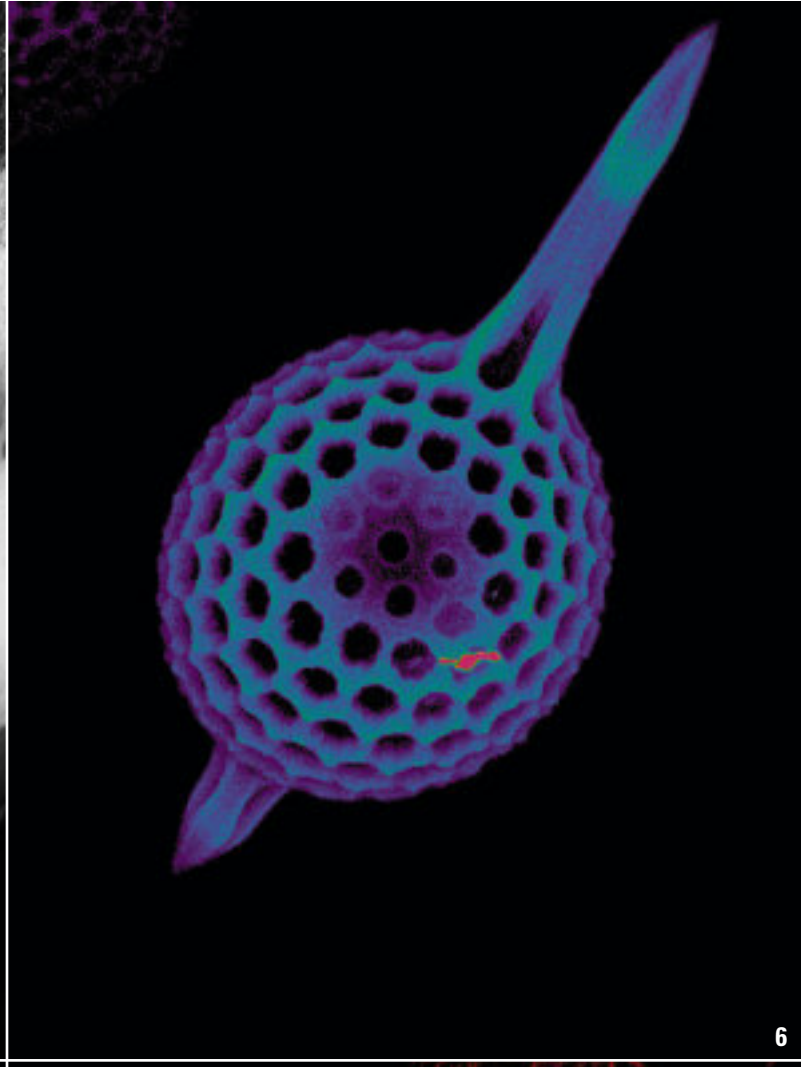
Spectacular Imaging

Affordable Excellence for your Daily Research

To make confocal technology accessible to a wide range of users in their daily research, we have developed the Leica TCS SPE, a high resolution spectral confocal, easy to use, extremely compact and robust – yet still affordable.

Without compromising our innovative concepts and high quality standards, the Leica TCS SPE offers outstanding spectral detection technology developed and patented by Leica Microsystems. New optical concepts for true colocalization plus a new Leica software platform common to our complete range of confocal and widefield products, simplify operation and reduce training time. You'll find it all in the Leica TCS SPE.

The highly integrated Leica TCS SPE has all you need for your daily research. It is optimized for applications such as live cell imaging and morphological studies in small research groups and multi user environments.



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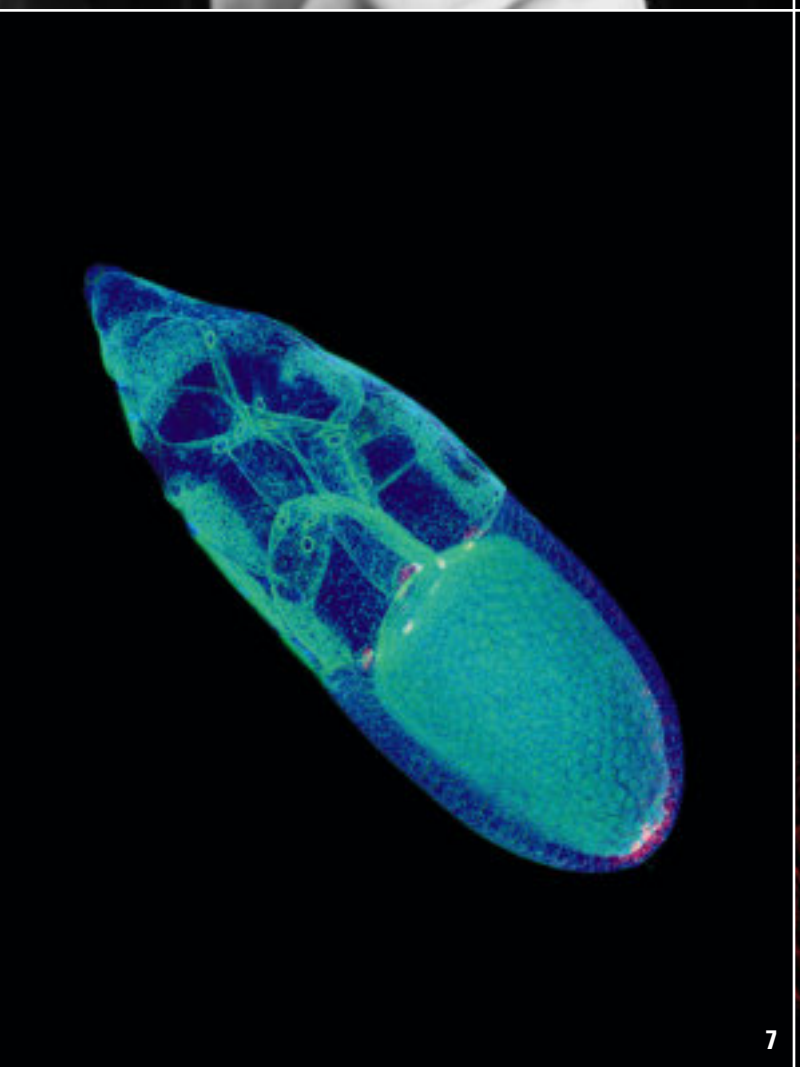

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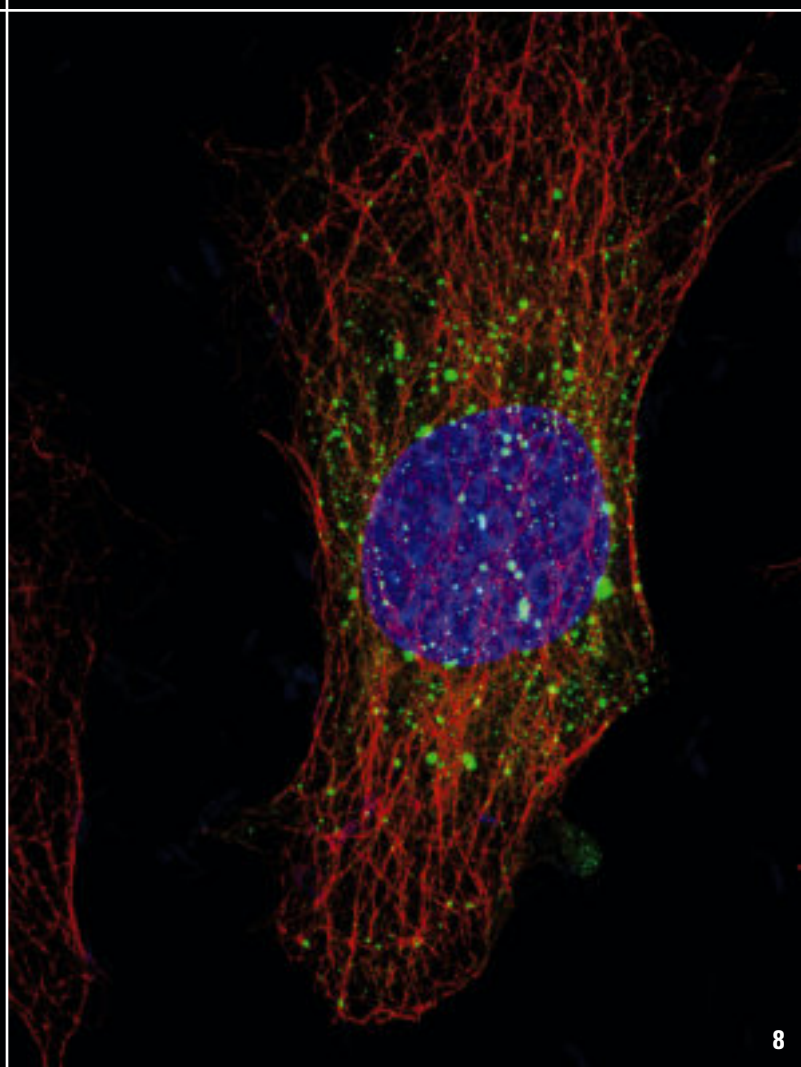

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The advantages of true confocal imaging

Scanning the specimen in thin optical layers and detecting the fluorescence signal point by point results in images free from the stray light of adjacent elements. The result – brilliant images at very high resolution. The information from each signal in each optical section is reconstructed by intelligent software into excellent 3D images, resolving the smallest detail of the specimen's structure.

Spectacular Imaging

Crystal clear 3D confocal images are our standard

Our confocal systems are famous for crystal clear high-resolution images with minimum noise, due to high performance components unrivalled in the confocal field. We have integrated this highly innovative and unsurpassed technology into the new Leica TCS SPE. To ensure high quality imaging, optimal excitation is provided by up to four low noise solid-state lasers with 488, 532 and 635 nm excitation lines for common dyes. The broad range of applications is extended by the 405 nm option for nuclear staining.

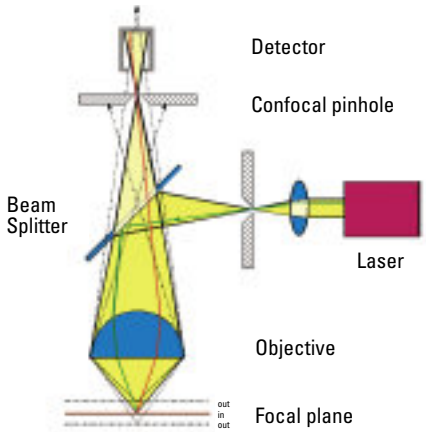
Ultra-high sensitivity with maximum spectral efficiency is ensured by our spectrophotometer based on a prism, which spreads the light into its spectrum. Maximum signal strength and optimal resolution is provided by a special high dynamics photomultiplier with photon booster technology, usually found in systems of a higher price range. The continuously adjustable pinhole diameter automatically adapts to all objectives. Channel multiplexing by sequential scanning prevents any cross-talk of dyes and results in excellent dye separation. Optimally integrated with our high performance research microscopes and optics, we fully harness our own technology to deliver the best images.

- 3D confocal imaging
- Variable motorized pinhole to match objectives
- 488, 532 and 635 nm excitation
- 405 nm excitation for nuclear stainings
- Low-noise solid state lasers
- Highly efficient prism for emission spectrometer
- High dynamic photomultiplier with photon booster technology

"Brilliant images, great technology and excellent cost performance ratio – Leica's TCS SPE is the ideal tool for our laboratory."

Jean-Luc Vonesch
Head of Imaging Center at the IGBMC (INSERM, CNRS, ULP), Strasbourg-Illkirch, France

The Confocal Principle



- Freely tunable spectral detection (430 - 750 nm)
- Fully flexible adjustment to specimen
- AOTF tuning for minimizing cell damage
- Motorized beam splitter
- Perfect colocalization with new ACS optics

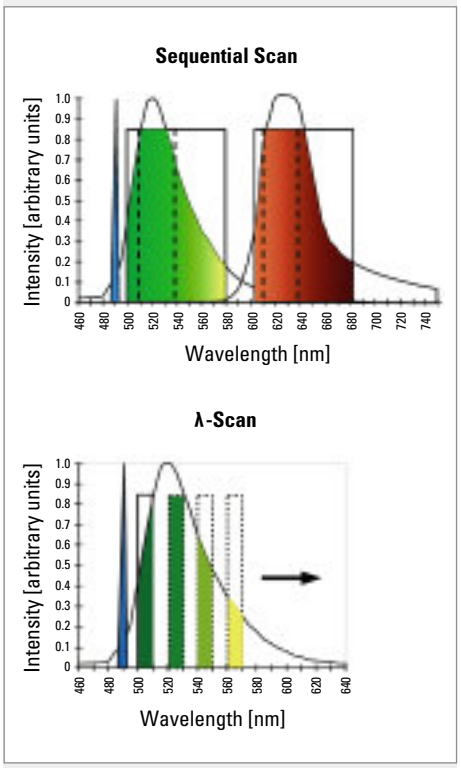
Spectral detection – exclusive to this class of system

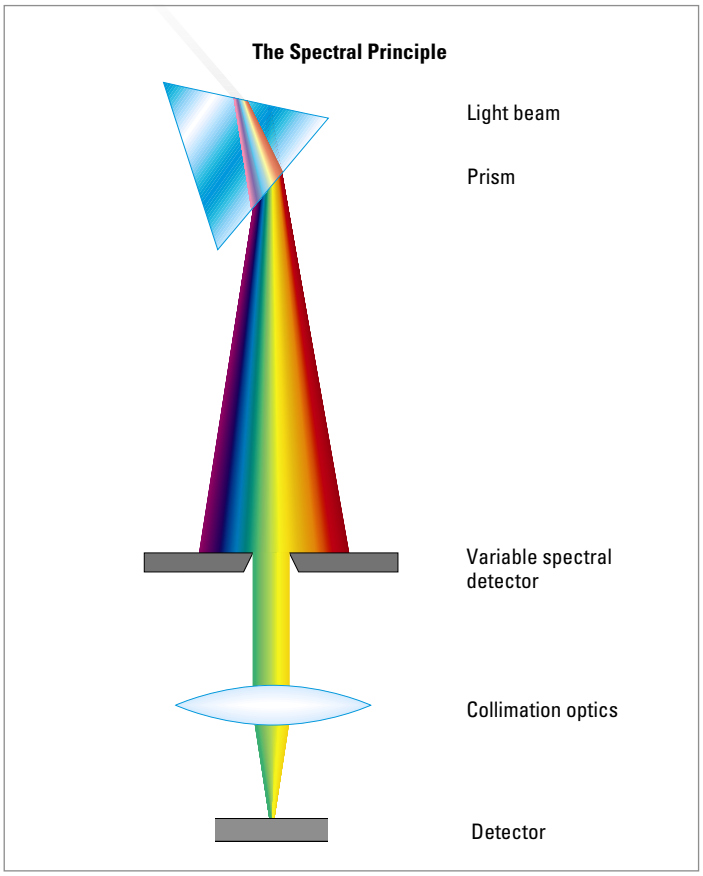
A freely tunable spectral range, maximizing signal independent of the fixed barriers of standard filters, is the ultimate goal for many researchers. The Leica TCS SPE uses the prism spectral detection system developed and patented by Leica Microsystems – well known for its unrivalled detection efficiency. It provides full flexibility in adjusting the wavelength to your specimen as you can continuously tune bandwidths from 430 nm to 750 nm. With the Leica spectral detection system you are completely independent of fixed filter settings.

Perfect characterization of your dyes

Characterize your dyes directly within the specimen and gain new information via a lambda scan. Profit from the freedom of using various dyes – today and tomorrow.

Better protection against cell damage will provide more reliable results. Confocal systems from Leica Microsystems are designed to ensure longevity of your specimens – whether they are fixed samples or living cells. The Acousto Optical Tunable Filter (AOTF) minimizes exposure to light by individual tuning of the laser power.

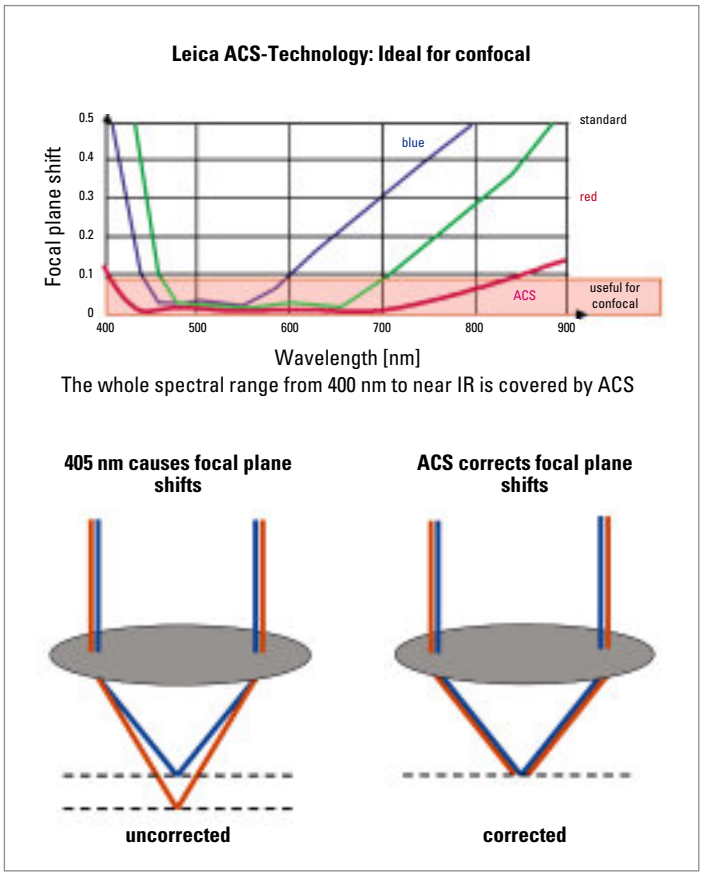




Perfect colocalization

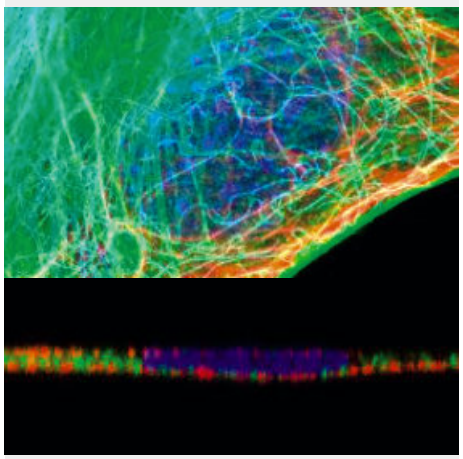
Benefit from clear and true confocal signals over the full spectral range by perfect super positioning of all laser foci at only one point in the focal plane. For example, a nucleus stained with DAPI is projected in its natural position in the center of the cell.

For perfect colocalization in the specimen, the Leica TCS SPE confocal system applies the brand new Advanced Correction System (ACS) technology by Leica Microsystems. This truly innovative optical design of the light paths, from excitation to detection, guarantees ideal transmission from 400 nm to 830 nm. With ACS technology, additional correction optics and beam splitters in the light path are redundant. Maximum transmission is achieved within the entire light band from 405 nm to infrared. Profit from ultra-bright pin sharp images with ACS.



"Top technology made available to non-expert users. TCS SPE has the advantages of a latest generation confocal, and its simplicity makes it really easy to use."

Dr. Maria C. Montoya
Confocal Microscopy and Cytometry Unit
Biotechnology Program
Spanish National Cancer Center (CNIO)
Madrid, Spain



- Minimal training effort
- Reliable, ergonomic software LAS AF
- Software upgradable to deconvolution, Motion Spy, Dye Finder and more
- Preinstalled system settings
- Easy data transfer
- Personal USB for storage of individual instrument settings
- Multiple export functions
- Analysis of specimen with up to 8 color stainings

Easy confocal imaging: 6 steps to 3D

1 Start the system
2 Insert and focus specimen
3 Select instrument settings
4 Define z-range and acquire
5 Calculate 3D image
6 Save and close

Easy to Achieve

True Confocal is not Complicated

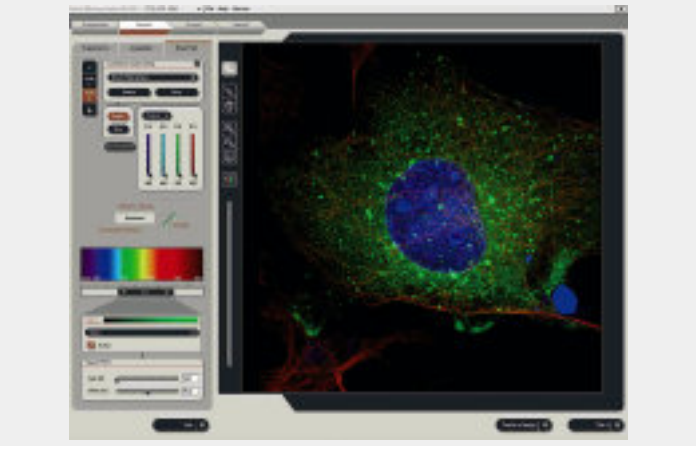
The Leica TCS SPE is an instrument designed to make your work as uncomplicated as possible. It requires minimal training effort and first results can be achieved immediately. Its reliable and ergonomic software leads you straight through your experiment without losing precious time.

Easy to use

The standardized, self-explanatory user interface of the Leica Application Suite Advanced Fluorescence (LAS AF) software enables you to start your work autonomously with the first click of a button. Newcomers to confocal will appreciate the uncomplicated software with its workflow-oriented screens. They guide you through your experiment from the selection of the objective up to the reconstruction of the first 3D image. Full application flexibility is offered by extending the software capabilities with additional modules, opening up your project possibilities to applications such as deconvolution, time lapse and spectral unmixing.

Easy interfacing

Preinstalled and optimized system settings for defined dyes ensure fast and excellent results right from the start. More experienced users profit from the full flexibility of the automated system for individual tuning of different experiments. With the wavelength selector, you can easily adjust the detection range as both excitation laser line and emission spectra of the dye are displayed in the same window. Just align the detection range sliders and you are ready to start spectral imaging. For future applications the full software suite of LAS AF is open to you.



Wavelength selection and laser attenuation

Your data – easy to transfer, easy to share

After your work session you can ensure repeatable results by saving your individual settings on a USB stick. Continue working any time at from exactly the same point – even if other users have used the system in the meantime for other applications with different settings.

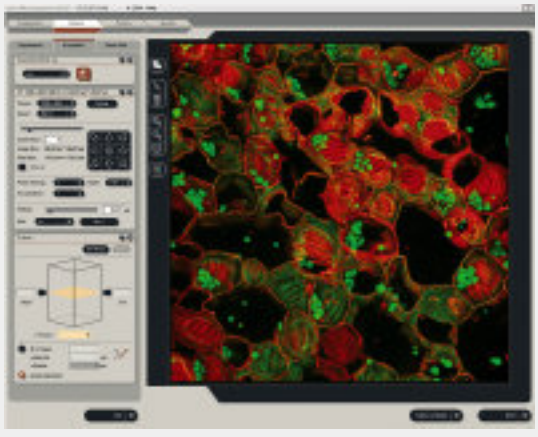
Exchange of data is easy with the multiple export functions of the Leica TCS SPE. Aside from the USB stick you can use the LAN connectivity interface for local server connection. Benefit from fast transfer of your experimental results to PCs or Apple Macintosh computers or send data direct to the printer. With such easy data sharing, you and your colleagues will harness true teamwork for accelerated results.

Designed for target applications in research laboratories …

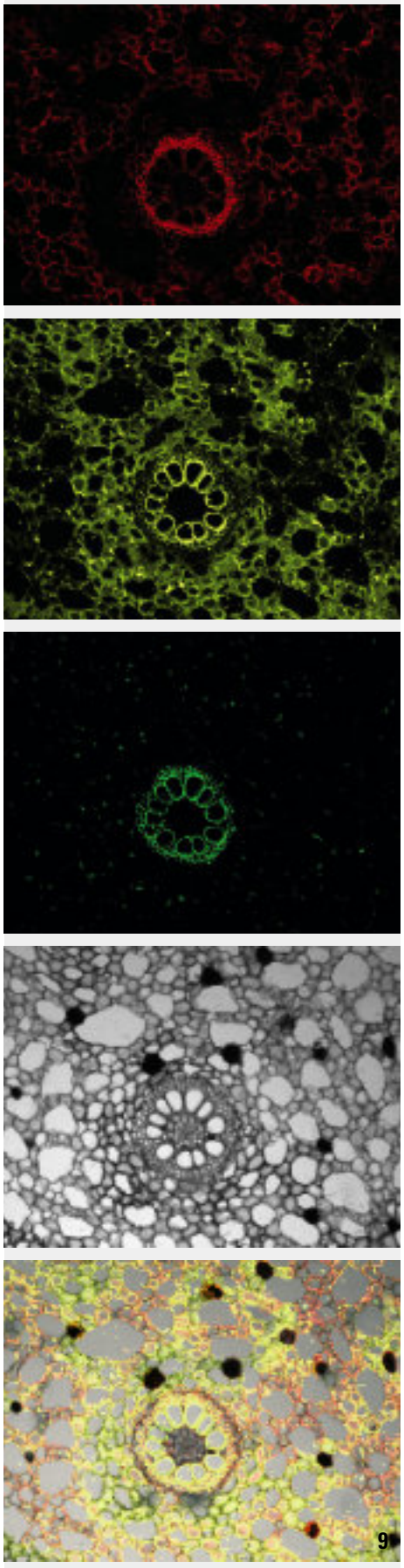
The Leica TCS SPE is the ideal instrument for morphologic investigations as well as for live cell studies into cell division or cell growth. Analyze up to eight colors of multi stained samples or track GFP development in time lapse experiments. Generate overlays of transmitted light images with fluorescent information to investigate the developmental biology of your specimen.

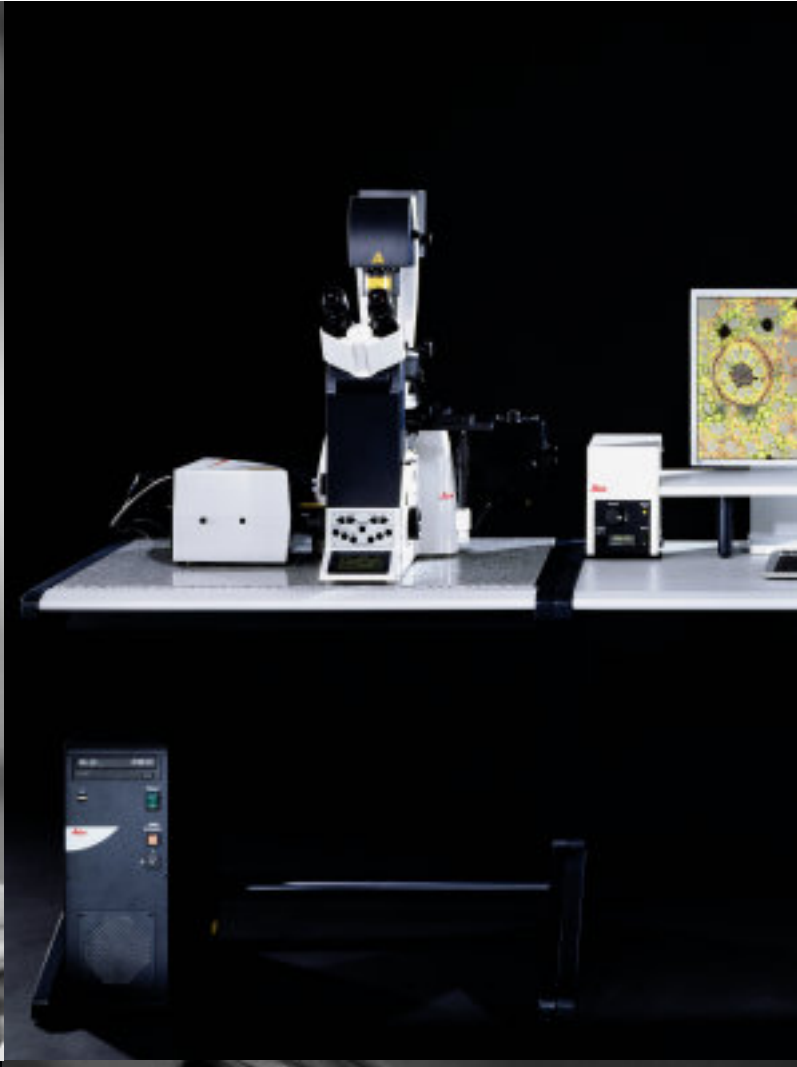
… and pharma-biotechnology

The Leica TCS SPE is an extremely stable and reliable partner for routine applications in biotechnology. Screen your cells at defined intervals to discover new effects of active agents on target cells or test the impact of new compounds on tissues while discovering new drugs. Gain a closer insight into cells involved in fermentation processes, routinely monitor culture processes or simply document growth experiments in microwell plates. The Leica TCS SPE provides the perfect opportunity to optimize many aspects of bio-production.



Z-range definition






Leica
Intensity
Shutter
Shutter
Power

A reliable system is a must for routine laboratory work. The robust and durable hardware with long-life components and easy to use software, make the Leica TCS SPE an indispensable workhorse that totally fulfils these exacting demands.

A Reliable System

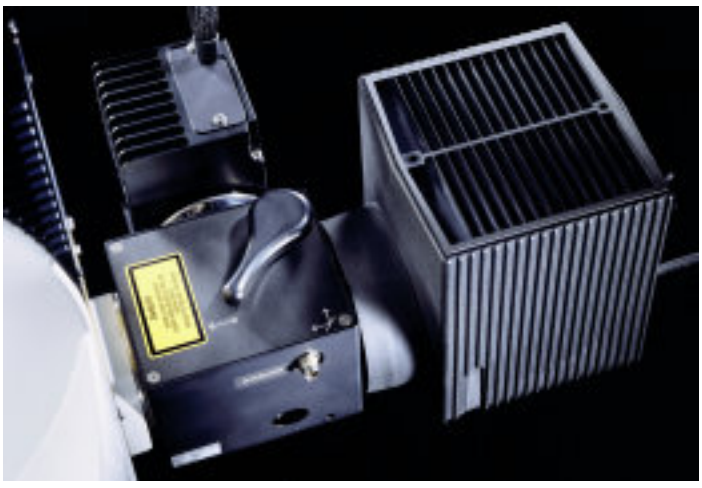
Concentrate on your Work – Not on Your System

Reliability and robustness in your every day work

Long-life solid-state lasers are combined with additional optical elements installed on the robust interior optical bench. Instead of filter wheels, we have integrated the AOTF and kept the number of moving parts to a minimum. This shortened light path with a single fiber coupling requires minimum maintenance. The workflow oriented and self-explanatory LAS AF software enables smooth and fast operation. The system requires little maintenance and minimises the workload of system administrators. Conflicts with other software or from Internet downloads are avoided as the system runs exclusively with the Leica operating software, keeping the system virus free and secure.

Highly integrated system

The Leica TCS SPE is a highly integrated system – extremely compact and robust with a supply unit no larger than a standard PC. Equipped with solid-state lasers, the system needs no extra cooling. With its small footprint and standard room requirements, the Leica TCS SPE fits into any laboratory.



Transmitted light detector

- Long lifetime components
- Minimal maintenance
- Smooth and fast operation
- Highly integrated system
- Small footprint
- Only standard room requirements

“High precision, robust technique and easy to use software is what we always looked for. Leica’s new confocal will become our workhorse for routine research.”

Dr. Markus Dürrenberger
Microscopy Center (ZMB)
University Basel
Basel, Switzerland

- High resolution
- True confocal imaging
- Freely tunable spectral detection
- Ready for new dyes
- Broad laser excitation range
- Stable solid state lasers
- Fully automated
- 100% tunable (AOTF, pinhole)
- Perfect colocalization throughout the spectrum with ACS
- No special room requirements
- Flexible to upgrade by defined kits
- Modular software and hardware

From high resolution fluorescence imaging to 3D reconstruction and time lapse, the new Leica TCS SPE provides all the features you need – at a highly attractive price.

Affordable Excellence

Enter the world of high resolution 3D fluorescence imaging

Profit from Leica's years of experience and enter the world of top confocal microscopy. Achieve excellent results and detailed information in your specimen and reach new goals with your research. The Leica TCS SPE platform opens new horizons for scientific research and offers an affordable start to high quality 3D fluorescence imaging. The system can grow with your changing requirements, thanks to a range of easy to install upgrade kits. Regardless of whether your chosen option is a transmitted light detector or a new software module, single-supplier compatibility is assured.

The flexible system is easy to operate – forget about time consuming instructions and complex tutorials. Our new software platform is self-explanatory and guides you through the entire workflow from image acquisition to high-resolution 3D reconstruction. Predefined and optimized Leica settings guarantee high-end results every time.

Spectacular images can be printed immediately for discussion and larger data sets can be stored on DVD or server. Should you have new applications or further questions, our application specialists will be happy to share their wealth of experience with you.


10

Leica TCS SPE sets new standards in your imaging center

Leica Microsystems stands for excellent quality and ingenuity. Whether top-range or entry-level, we never compromise on the quality of our confocal microscopes.

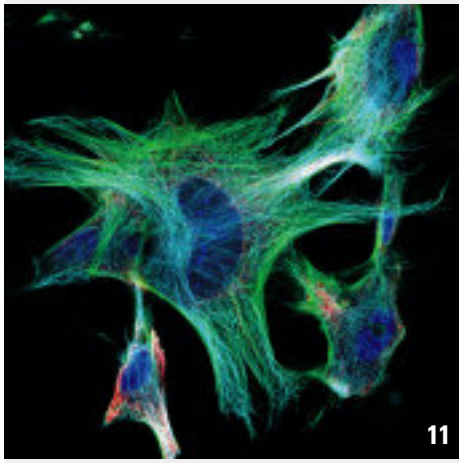
Increase your capacity: the new Leica TCS SPE offers high-end imaging at an affordable price. After a short installation time, the system is ready for action. Easy to use software minimizes training effort, allowing scientists to work with the confocal straight away. As the Leica LAS AF software is the only software installed, internet downloads or other software installations are not possible, minimising maintenance and administration. This also facilitates large user groups. With no compromise in image quality, the SPE will also relieve the workload of your high-end imaging systems.

LAN connectivity and external devices such as USB or DVD burners ensure full compatibility with your environment and easy data exchange. To achieve reproducible results, scientists are able to store individual instrument settings together with their results on their own USB stick. For highest utilization of the system, post processing of images can be performed on a separate workstation thanks to easy data export functions.

Specially selected long-life components, such as solid-state lasers and robust technologies, make the TCS SPE stable and reliable and reduce the cost of ownership. Service contracts provide maximum system uptime. The high-resolution spectral confocal system Leica TCS SPE will become the ideal workhorse for your daily research.

The Leica TCS SPE is your reliable partner in research, providing you with spectacular results – easily and at an affordable price.

- Leica image quality
- Minimal administration
- Little training required
- Predefined instrument settings
- Single software platform
- Easy data transfer
- Individual settings on USB stick
- Reliable system
- Highly efficient, maximum capacity
- Service contracts



11

Leica Design by Christophe Apothéloz

Acknowledgements:

We gratefully acknowledge the following scientists for providing images:

1 Mouse fibroblasts
Green: F-Actin, FITC; Red: Tubulin, Cy5; Blue: Nuclei, DAPI
Courtesy of Dr. Günter Giese, Max Planck Institute for Medical Research, Heidelberg, Germany

2, 8 COS 7 cells
Green: uncharacterized protein, GFP; Red: α-Tubulin, Cy3;
Blue: Nuclei, DAPI
Courtesy of Prof. Wei Bian, Cell Research Center, Institute of Biochemistry and Cell Biology, SIBS, CAS, Shanghai, China

3 Mouse kidney section
Green: glomeruli and convoluted tubules, Alexa 488 WGA;
Red: F-Actin (prevalent in glomeruli and brush border);
Blue: Nuclei, DAPI
Leica Microsystems CMS GmbH, Mannheim, Germany

4 *Drosophila melanogaster*, larval stadium
Green: Feb211 positive neurons and their axons, Alexa 488;
Red: fibrous part of the cns (i.e all axons), Cy3; Blue: Nuclei, DAPI
Courtesy of Dr. Christoph Melcher, Research Institute Karlsruhe, Institute for Toxicology and Genetics, Eggenstein-Leopoldshafen, Germany

5 Mouse fibroblasts
DIC
Courtesy of Dr. Günter Giese, Max Planck Institute for Medical Research, Heidelberg, Germany

6 *Radiolaria*
Silica-skeleton, reflection mode
Leica Microsystems CMS GmbH, Mannheim, Germany

7 *Drosophila melanogaster*, egg chamber
Red: Nuclei, Cy5; Blue: Cytoplasmatic and Nuclear GFP, GFP;
Cyan: Actin, Phalloidin-Rhodamin
Dr. Juliette Mathieu, Rørth Lab, European Molecular Biology Laboratory; EMBL, Heidelberg, Germany

9 *Phaseolus vulgaris,* native plant stipe
Autofluorescence with 488 nm, 532 nm, 635 nm excitation and transmitted light; overlay image
Courtesy of Dr. Markus Dürrenberger, Microscopy Center (ZMB), University Basel, Switzerland

10 *Drosophila melanogaster*, egg chamber
Green: Actin, Phalloidin-Rhodamin; Red: Cytoplasmatic and Nuclear GFP, GFP; Blue: Nuclei, Cy5
Dr. Juliette Mathieu, Rørth, European Molecular Biology Laboratory; EMBL, Heidelberg, Germany

11 Mouse fibroblasts
Green: F-Actin, FITC; Red: Vimentin, Cy3, Blue: Nuclei, DAPI
Courtesy of Dr. Günter Giese, Max Planck Institute for Medical Research, Heidelberg, Germany

Leica Microsystems – the brand for outstanding products

Leica Microsystems' mission is to be the world's first-choice provider of innovative solutions to our customers' needs for vision, measurement and analysis of microstructures.

Leica, the leading brand for microscopes and scientific instruments, developed from five brand names, all with a long tradition: Wild, Leitz, Reichert, Jung and Cambridge Instruments. Yet Leica symbolizes innovation as well as tradition.

Leica Microsystems – an international company with a strong network of customer services

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and representatives of Leica Microsystems in more than 100 countries.

The companies of the Leica Microsystems Group operate internationally in three business segments, where we rank with the market leaders.

• Microscopy Systems

Our expertise in microscopy is the basis for all our solutions for visualization, measurement and analysis of microstructures in life sciences and industry. With confocal laser technology and image analysis systems, we provide three-dimensional viewing facilities and offer new solutions for cytogenetics, pathology and materials sciences.

• Specimen Preparation

We provide comprehensive systems and services for clinical histo- and cytopathology applications, biomedical research and industrial quality assurance. Our product range includes instruments, systems and consumables for tissue infiltration and embedding, microtomes and cryostats as well as automated stainers and coverslippers.

• Medical Equipment

Innovative technologies in our surgical microscopes offer new therapeutic approaches in microsurgery.

Winner 2005

Innovationspreis der deutschen Wirtschaft
The World's First Innovation Award

www.leica-microsystems.com/Confocal_Microscopes

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