

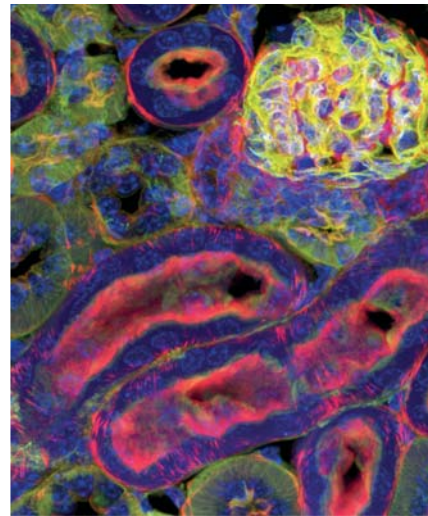
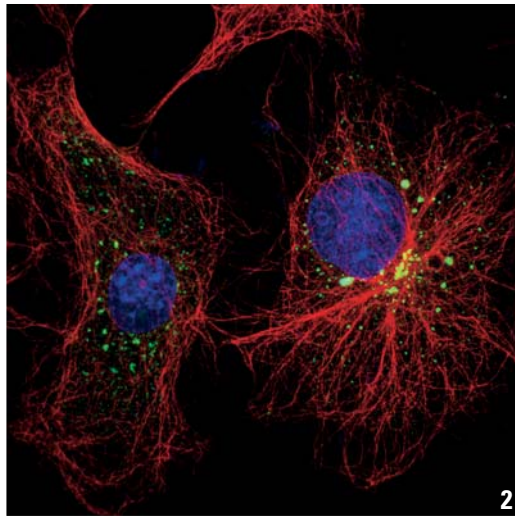
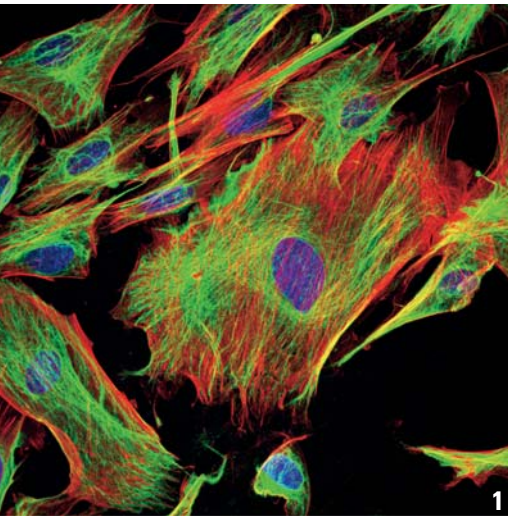


Spectacular Imaging!

The New High Resolution Spectral Confocal
Affordable Excellence for Life Science Research

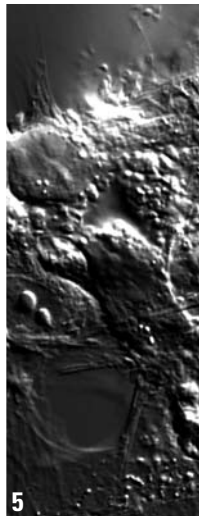
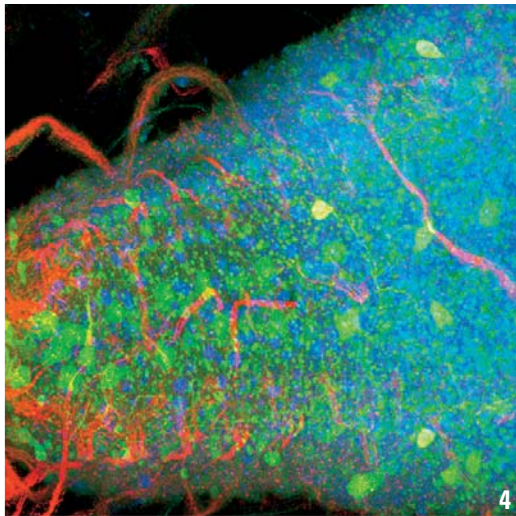
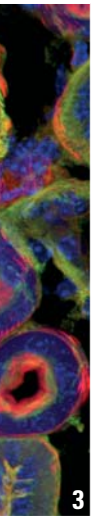
Living up to Life

Leica
MICROSYSTEMS



- Spectacular Imaging
- Easy to Achieve
- Built-in Reliability
- Affordable Excellence





Confocal applications have increased tremendously and high-resolution imaging is the key to new discoveries in life science research. In clinical, pharmaceutical and biotech research, the demand for high quality 3D is growing. Confocal microscopes provide high resolution but most of the systems are complex, requiring intensive training and special room conditions.

Spectacular Imaging

Affordable Excellence in Life Science Research

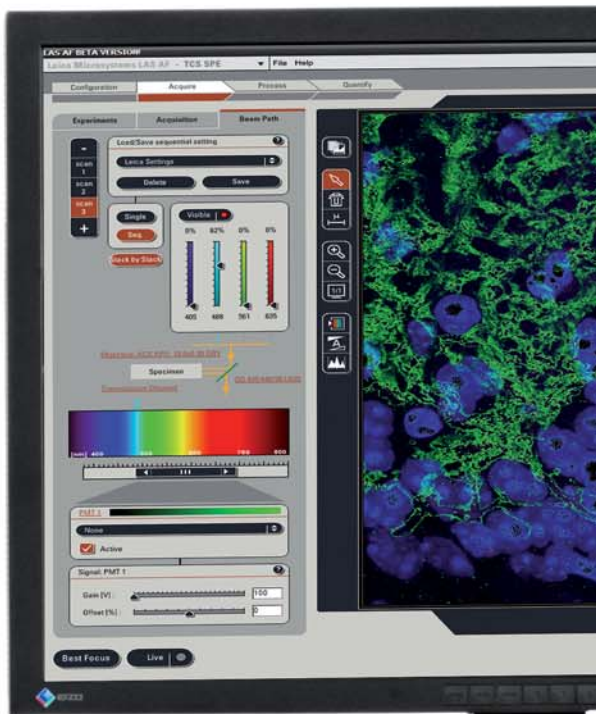
Leica Microsystems has developed the new Leica TCS SPE to make confocal technology accessible to a wider range of scientists. This high resolution confocal is easy to use, extremely compact and robust, providing affordable excellence for imaging.

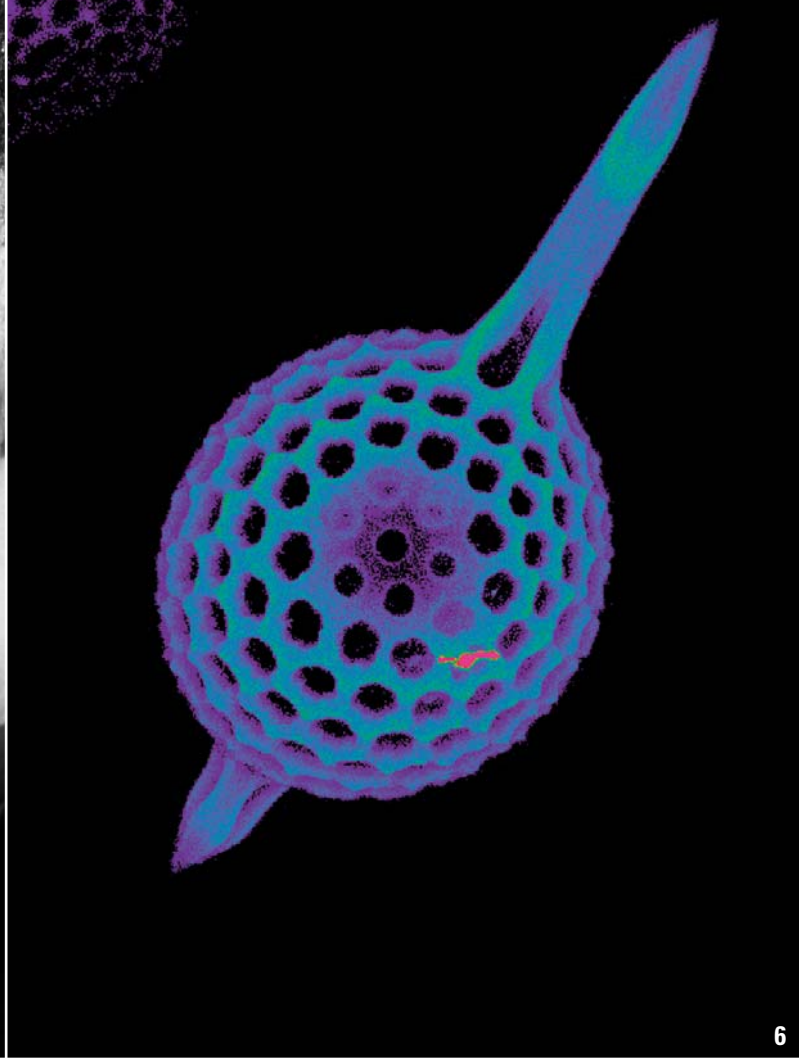
Leica TCS SPE offers outstanding spectral detection technology patented by Leica Microsystems for maximum image quality – without any compromises.

The innovative optical concepts for true colocalization combined with robust solid-state lasers fulfill the highest standards in imaging.

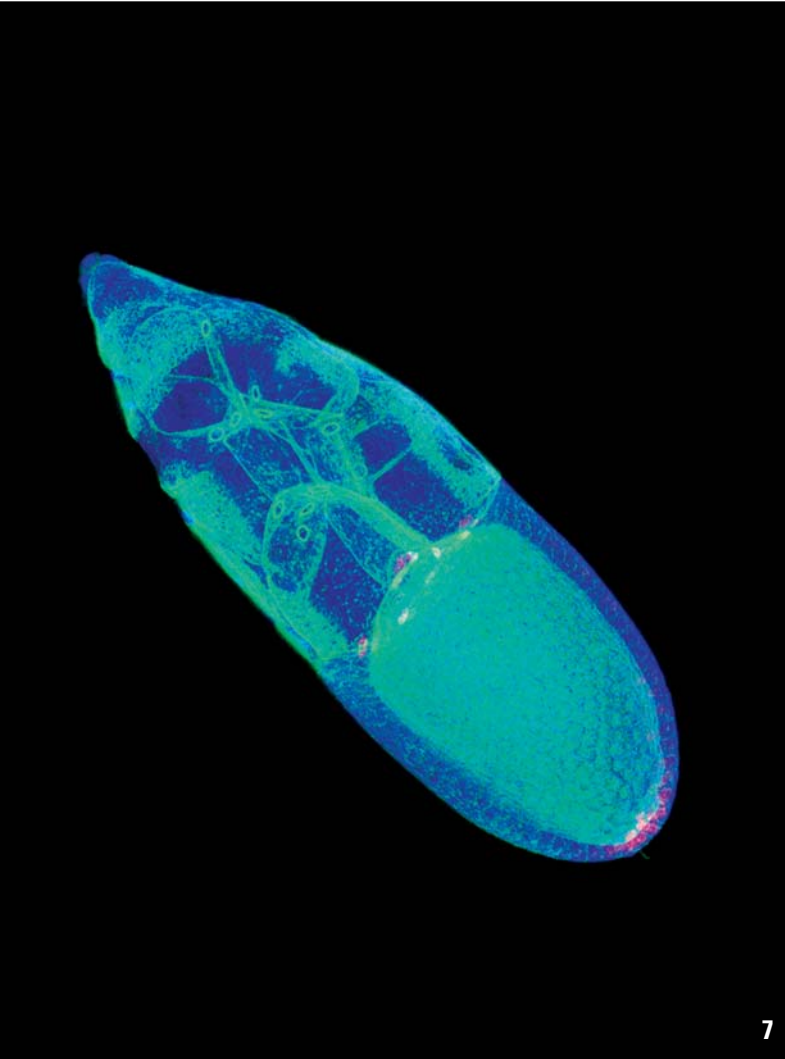
Easy to operate via the standard Leica software platform, the Leica TCS SPE is up and running after minimum training.

Crystal clear images, fast camera option and environmental accessories: this highly integrated system provides what is needed for daily research.

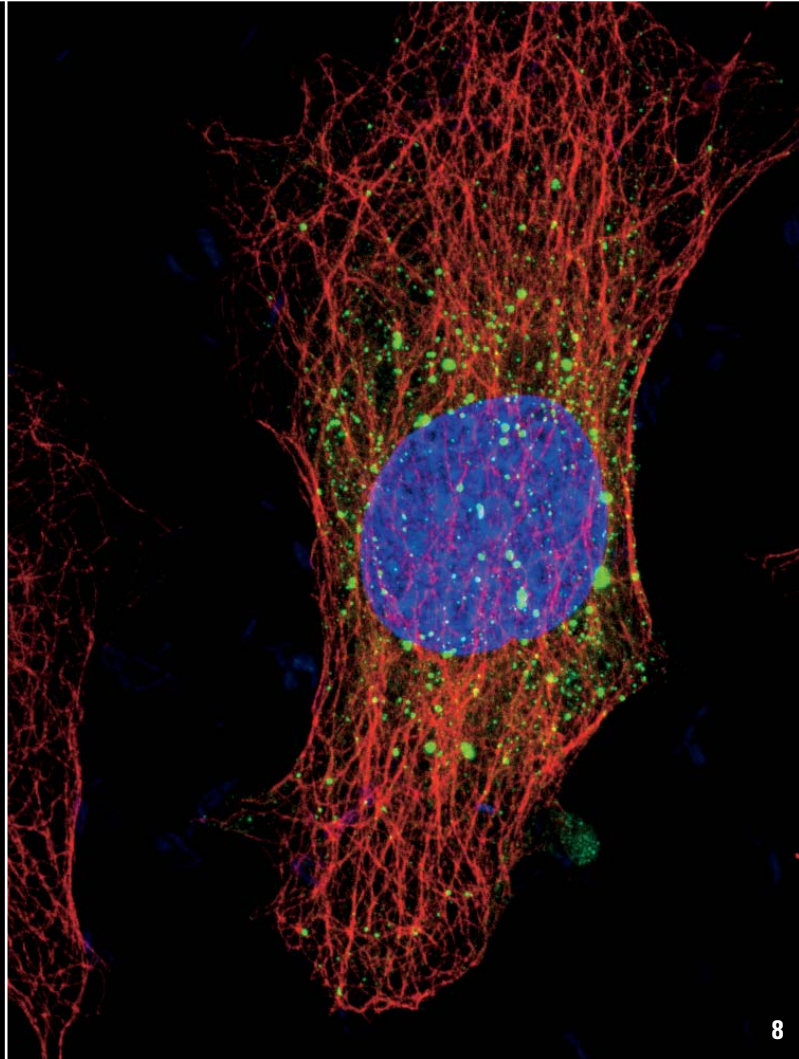




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Benefit from True Confocality

Brilliant images at highest resolution are achieved by scanning the specimen in thin optical layers, point by point. The Leica TCS SPE detects fluorescence signals without any stray light from adjacent cells. Intelligent software reconstructs excellent 3D images, resolving the smallest details and providing maximum information for your research.

Spectacular Imaging

Crystal Clear Confocal Images –

Our Standard for Your Research

All Leica confocal systems are famous for crystal clear images of highest resolution. The Leica TCS SPE exclusively provides four low noise solid-state lasers for a wide range of applications. The small bandwidth 488, 532, 561 and 635 nm excitation lines for common dyes are complemented by the 405 nm option for nuclear staining.

Adjust the excitation power freely by using the AOTF (Acousto-Optical Tunable Filter) to minimize bleaching and avoid phototoxic effects on your living cells.

Leica High-Tech – The Key for Your Research

Ultra high sensitivity is achieved by the Leica Microsystems' spectral detector. The combination of a special glass prism with a selected high dynamic photomultiplier, usually found in higher priced systems, offers maximum signal efficiency to detect even the weakest signals precisely.

Excite up to eight dyes per sample sequentially. Channel multiplexing prevents any cross-talk of dyes and results in excellent dye separation.

Maximum Flexibility for Best Results

Adjustable z-resolution is an advantage of Leica Microsystems. The motorized pinhole allows image fine-tuning and can also be adjusted manually if stronger signals are required. In daily operation the infinitely variable pinhole diameter automatically adjusts after objective changes to ensure the best optical conditions for your experiments.

- True confocal point scanner
- Tunable spectral detector
- Solid state laser exclusively
- 488, 532, 561, 632 nm excitation
- 405 nm excitation for nuclear staining



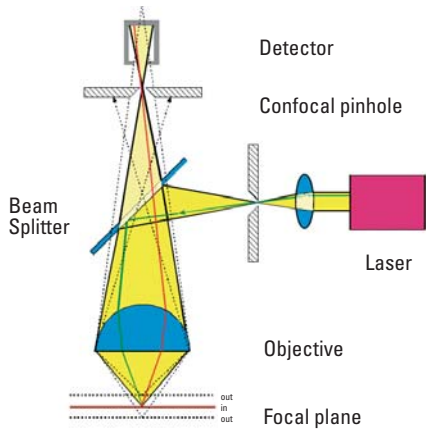
“Brilliant images, great technology and excellent cost performance ratio – Leica’s TCS SPE is the ideal tool for our laboratory.”

Jean-Luc Vonesch

Head of the Imaging Center at the IGBMC (INSERM, CNRS, ULP), Strasbourg-IIIkirch, France

- Freely tunable: 430 – 750 nm
- AOTF laser tuning 0 – 100%
- Motorized pinhole
- New ACS optic design for perfect colocalization
- Eight dyes per sample

The Confocal Advantage



Spectral Detection – Exclusive to This Class of System

A freely tunable detection range independent of the limits of fixed filter barriers provides ultimate detection flexibility.

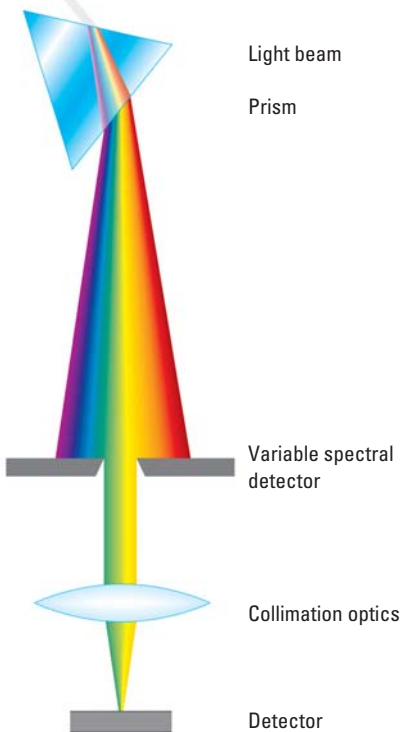
The Leica TCS SPE uses spectral prism technology with unrivaled detection efficiency from 430 to 750 nm. Benefit from the freedom for your fluorescence experiments and use miscellaneous dyes without filter changes – today and in the future.

Get More Signal

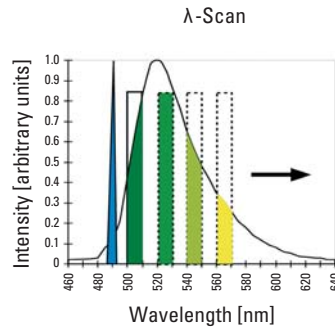
Catch more light by opening the detection window and reduce laser power by AOTF – both are infinitely variable – and maximize the signal at minimum bleaching. The Leica TCS SPE is designed to ensure longevity of fixed samples or living cells.

More signal, less averaging and faster imaging with less photo-toxic impact on your specimen are clear advantages of the efficient, directly coupled spectral detector range.

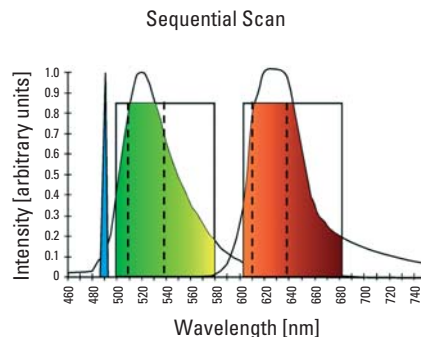
Spectral Technology



Find Your Spectra



Maximum Signal, No Cross-talk

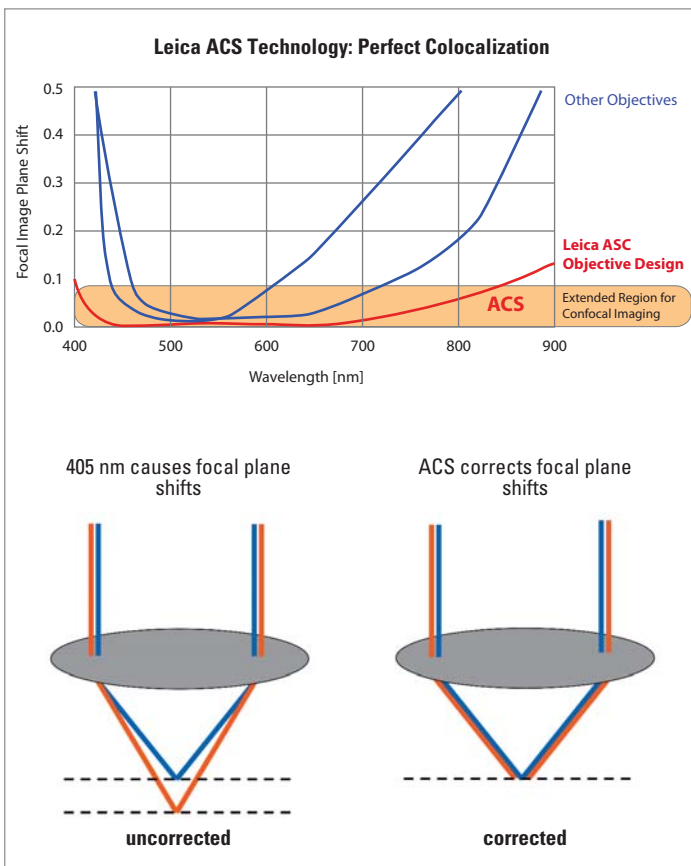


Perfect Colocalization

Benefit from perfect super positioning of all laser foci at the same focal plane and obtain clear images over the full spectral range.

The Leica TCS SPE provides the unique Advanced Correction System (ACS) technology. This innovative optical design of the light path compensates focus shifts from the objective to the detector – without any further correction lens. Additional light-consuming lenses or motorized beam splitters are not required and moving parts are avoided to minimize maintenance.

Maximum transmission is achieved within the entire light band from 405 nm to near infrared. Benefit from ultra-bright pin sharp images with ACS optics!



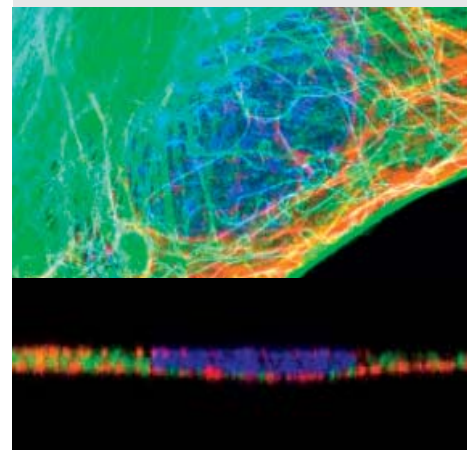
“Top technology made available to non-expert users. TCS SPE has the advantages of a latest generation confocal, and its simplicity makes it really easy to use.”

Dr. Maria C. Montoya

Confocal Microscopy and Cytometry Unit
Biotechnology Program
Spanish National Cancer Center (CNIO)
Madrid, Spain

Excellent Research Results

Obtain true information from 405nm to near infrared by perfect colocalization of all colors in one plane.



The maximum projection and the corresponding xz-scan below prove the quality of Leica's excellent optics.

- Standardized user interfaces
- Ergonomic software
- Preinstalled settings
- Minimal training effort
- Multiple export functions
- OME data interface
- Easy data transfer
- High content screening package
- 3D software, time lapse and deconvolution upgrades

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 Achieve

True Confocal is not Complicated

Easy Interfacing for Minimum Training

The standardized, self-explanatory user interface of the 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. The user interface guides you through the experiment from the objective selection up to the reconstruction of the first 3D image. Pre-installed and optimized system settings for defined dyes ensure fast and excellent results right from the start.

Optimal Results in Life Science Research

More experienced users profit from the full flexibility of the automated system for individual tuning of different experiments. For future applications the full software suite of LAS AF is open to you. Extended modules such as FRAP, deconvolution, time lapse and spectral unmixing offer additional application flexibility.



- 1 Place your sample, load the settings
- 2 Set the excitation lasers
- 3 Tune the spectral detection
- 4 Adjust the detector
- 5 Get the result!

Experiment Data – Easy to Transfer, Easy to Share

Ensure reproducible results by saving your instrument settings on personal drives or network locations and be ready for the next project. Share your results with colleagues who run the same experiments.

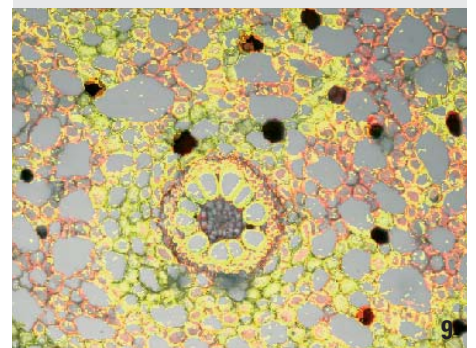
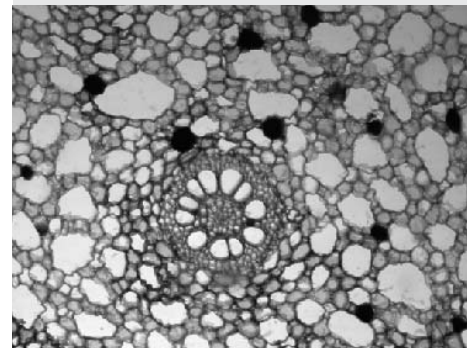
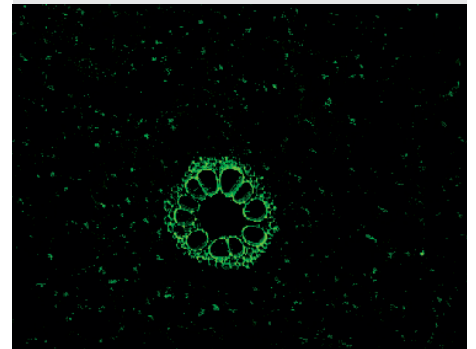
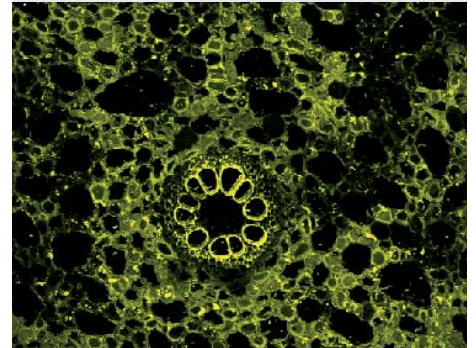
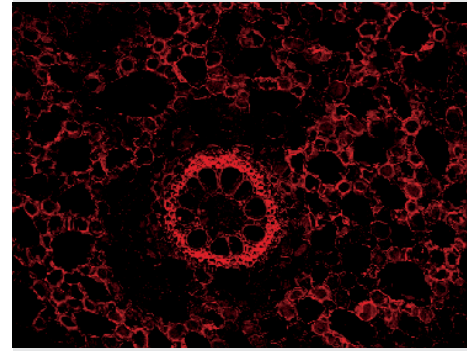
Imaging data may be stored locally, at a personal or network attached storage device (NAS). Additional data exporter software enables the storage of TIFF or OME.TIFF formats which are compatible with the Open Microscopy Environment (OME).

Multiple Applications in Research and Pharma-Biotechnology

The Leica TCS SPE is a universal imaging tool for research and biotechnology. The capacity to analyze up to eight dyes provides extended flexibility to run fixed cell or *in vivo* experiments. Morphological imaging in daily routine or fundamental life cell quantification with FRAP gives the opportunity to track GFP in developmental biology or to quantify membrane diffusion coefficients *in vivo*.

Control bio-films or determine the quality of cells in bioreactors over time.

From basic 2D high resolution imaging up to 5D xyzλt-series, the Leica TCS SPE offers the full application flexibility of a modern research instrument, ready to support your experiments and relieve workload from your high-end systems.



Z-Stack :

1 Set Plane Go to

2 44.52 Begin [μm]

3 -39.99 End [μm]

z-Position [μm] 2.27

Nr. of steps 20

z-step size 4.45 μm

z-Volume 84.511 μm

Travel Range 250 μm

System optimized Compensation 4

5

1 Mark focal plane

2 Define top position

3 Define bottom position

4 Use system-optimized numbers of slides

5 Alternatively customize number of slices or step size manually



Maximum uptime and smooth operation are required to run multiple experiments efficiently. The Leica TCS SPE is a robust and reliable confocal with long-life components and easy-to-use interfaces, designed to provide researchers with turnkey reliability.

A Reliable System

Concentrate on Your Work – Not on Your System

Reliability and Robustness for Every Day

Powerful long-life solid-state lasers are combined with the optical elements on the solid chassis of the optical bench integrated in the merge module. AOTF crystals are used instead of filter wheels to precisely control the laser intensity.

The new optical concept with compact light-path and single fiber coupling is designed to minimize maintenance. Moving parts like filter wheels or correction lenses are not required. Realignment becomes obsolete. This is reliable and saves time and money.

Highly Integrated System

The Leica TCS SPE is a highly integrated confocal that fits into every laboratory. The supply unit is extremely compact, no larger than a standard PC. Exclusively equipped with solid-state lasers, the system is immediately ready to run without extra cooling. Special room conditions are no longer required.

Smooth System Administration

The Leica TCS SPE system concept of robust optical components plus a powerful external computer results in high long-term stability, minimizing maintenance and service. The standard Windows® 7 operating system perfectly matches local IT standards and ensures full network capability. Our self-explanatory software reduces training effort and provides minimal user support in your imaging facilities. With the TCS SPE, smooth operation in daily routine is assured.

- Long-life 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 have always looked for. Leica’s new confocal will become our workhorse for routine research.”

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



Transmitted light detector

- True confocal point scanner
- High resolution imaging
- Fast camera analysis
- Leica DFC 310/360
- Roper CoolSNAP HQ2
- Hamamatsu 9100-02 EM-CCD
- Perfect colocalization
- Full system automation
- High content screening
- No special room requirements
- Modular upgrades

The Leica TCS SPE sets new standards in your imaging center and represents excellent quality and ingenuity. Irrespective of whether you are starting small with a confocal microscope or a complete imaging system, the SPE platform is the right choice.

Prepared for the Future

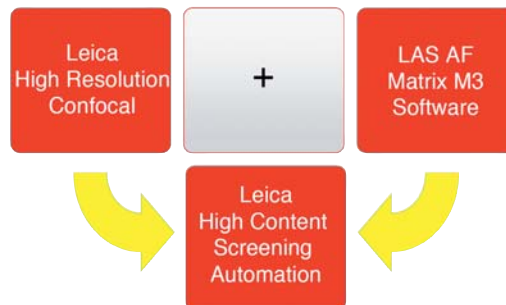
A System That Grows With Your Needs

The Best of Two Worlds

High-resolution confocal imaging can easily be combined with high-speed camera measurements. Predefined kits offer maximum dynamics in speed and precision for more than 100 frames per second.

High Content Screening

In systems biology, the number of complex experiments increases and statistical relevant data are required. Convert your Leica TCS SPE imaging tool into a high content screening system easily.



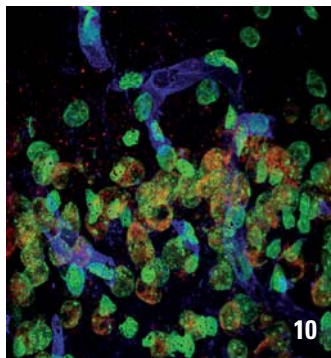
Individual Laboratory Use

Perfect for individual experiments and special research projects



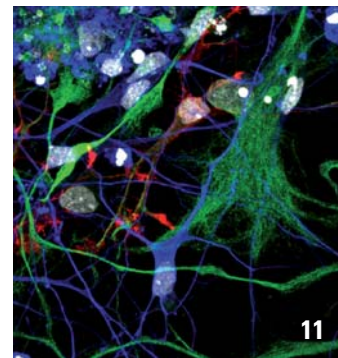
Neuroscience

Tissue slices, brain research in rats



Cell Culture

Cell culture, neuron cell outgrowth



By applying LAS AF Matrix software, the system runs fully automatically and screens well plates over night. Interfaces to automated image analysis even allow rare event detection and feedback automation. Customize your confocal for individual needs with the Computer Aided Microscopy programming interface and convert TCS SPE into an intelligent microscope.

Ready to Face New Tasks

From transmitted light detection up to multiple environmental control equipment, the Leica TCS SPE provides a comprehensive set of upgrade options.

From high-resolution multicolor fluorescence analysis to complex time-lapse experiments, the Leica TCS SPE achieves excellent results. As the system grows with your requirements, it is ready for new scientific challenges – today and in the future.

- High-end image quality
- TCS SPE system concept
- Little training required
- Minimal administration
- Robust and reliable
- Easy data transfer
- Perfect laboratory integration
- Highly efficient for maximum imaging capacity
- RemoteCare® maintenance

Affordable Excellence

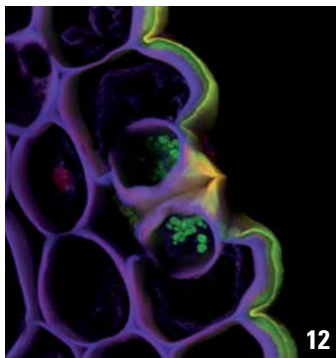
Enter the World of High Resolution Imaging

Take the Advantage

Profit from Leica Microsystems' expertise and enter the world of top confocal microscopy. The TCS SPE platform opens new horizons for scientific research and offers an elegant start to high quality imaging.

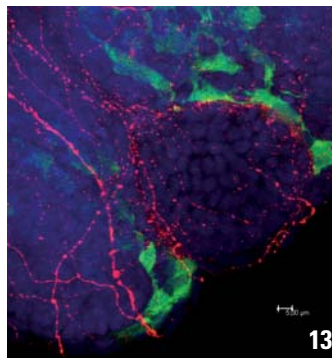
Environmental Biology

Plant science, stomata function in crop science



Developmental Biology

Genetics and proteomic research, eye in zebra fish



Optimal for Core Facilities

Leica TCS SPE: easy and robust, requires minimal training



Leica TCS SPE - Compact and Comprehensive

One Platform for Bench Top to *In Vivo* Imaging System



Leica TCS SPE RGBV with the manual DM2500 CSQ Microscope.



Leica TCS SPE RYBV workstation with the automated DMI4000 CSQ Microscope and *in vivo* cell equipment.

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 stage
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: cytoplasmic 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 of Basel, Switzerland
- 10** Rat brain
Blue: neurons, microtubule associated proteins, DCX Cy3; white: astrocyte marker, GFAP Cy2; red: neuronal marker, NeuN Cy5;
green: nuclei, DAPI. TCS SPE w. ACS APO 63x/1.30 Oil CS
FAN GmbH
- 11** Rat primary cortical neurons
Green: neuronal marker, axons, Nestin-Cy2; red: microtubule associated protein, neurons, DCX-Cy3;
Blue: neurites, β -III-Tubulin-Cy5; white: nuclei, DAPI. TCS SPE w. ACS APO 63x/1.30 Oil CS
FAN GmbH
- 12** Stomata, *convallaria* sp.
Violet: cell walls autofluorescence; green: chloroplasts; yellow: cuticula
Leica TCS SPE w. ACS APO 63x/1.30 Oil CS
- 13** *Danio rerio* 6 days zebrafish eye
Blue: nucleus, Hoechst 33342; green: GFP; red: acetylated α -tubulin, Alexa555-GaM secondary antibody
Leica TCS SPE w. ACS APO 40x/1.15 Oil CS
Courtesy of ICI Imaging Centre at the IGBMC, Illkirch, France

“With the user, for the user”

Leica Microsystems

Leica Microsystems operates globally in four divisions, where we rank with the market leaders.

● Life Science Division

The Leica Microsystems Life Science Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement, and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems' customers at the leading edge of science.

● Industry Division

The Leica Microsystems Industry Division's focus is to support customers' pursuit of the highest quality end result. Leica Microsystems provide the best and most innovative imaging systems to see, measure, and analyze the microstructures in routine and research industrial applications, materials science, quality control, forensic science investigation, and educational applications.

● Biosystems Division

The Leica Microsystems Biosystems Division brings histopathology labs and researchers the highest-quality, most comprehensive product range. From patient to pathologist, the range includes the ideal product for each histology step and high-productivity workflow solutions for the entire lab. With complete histology systems featuring innovative automation and Novocastra™ reagents, Leica Microsystems creates better patient care through rapid turnaround, diagnostic confidence, and close customer collaboration.

● Medical Division

The Leica Microsystems Medical Division's focus is to partner with and support surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

The statement by Ernst Leitz in 1907, “with the user, for the user,” describes the fruitful collaboration with end users and driving force of innovation at Leica Microsystems. We have developed five brand values to live up to this tradition: Pioneering, High-end Quality, Team Spirit, Dedication to Science, and Continuous Improvement. For us, living up to these values means: **Living up to Life.**

Active worldwide

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Korea:	Seoul	Tel. +82 2 514 65 43	Fax +82 2 514 65 48
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Sweden:	Kista	Tel. +46 8 625 45 45	Fax +46 8 625 45 10
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and representatives in more than 100 countries