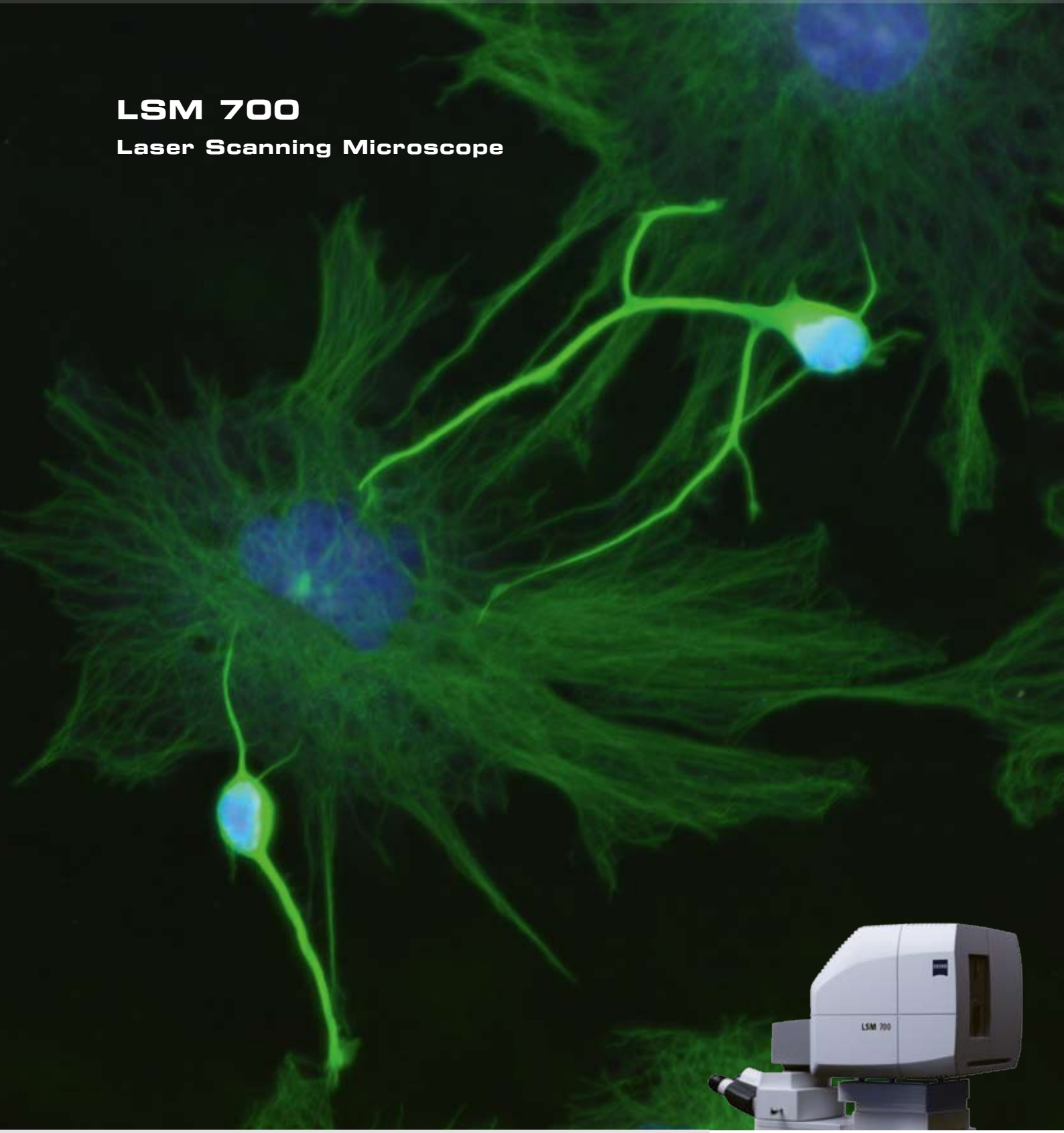
LSM 700

Laser Scanning Microscope



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Excellence for Your Research – Easing the Stress on Your Budget

The LSM 700 combines technologies of the current LSM 7 generation with specially developed innovations. It is a full sensitivity spectral system with a unique price/performance ratio.

Cover image:
Cortical neurons and glia cells in culture.
Green: Alpha-Tubilin-Alexa 488. Blue: Nucleic acids, DAPI.
Sabine Thomas and Prof. Dr. Michael Kiebler, Brain Research Center, Neuronal Cellular Biology, Medical University of Vienna, Austria

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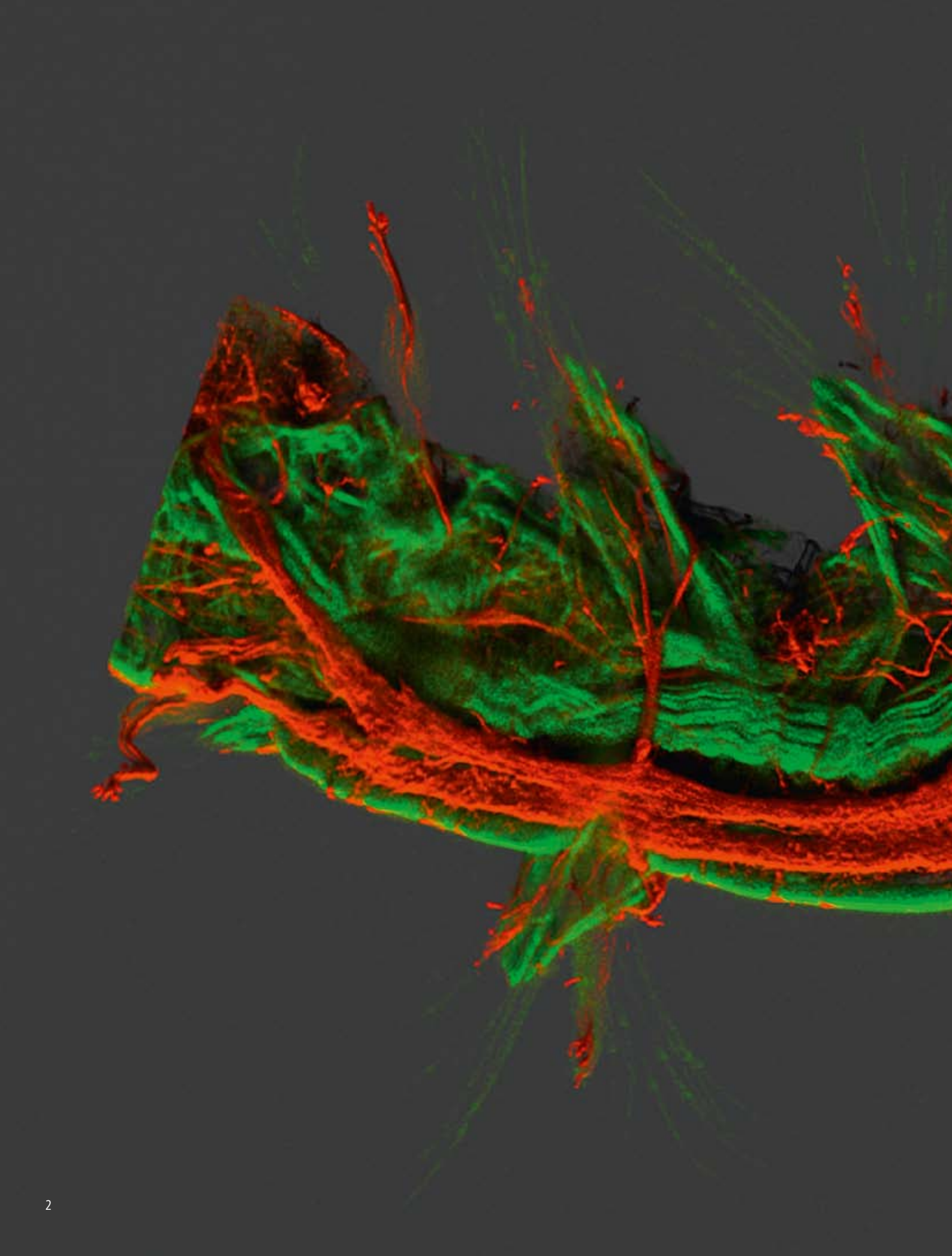
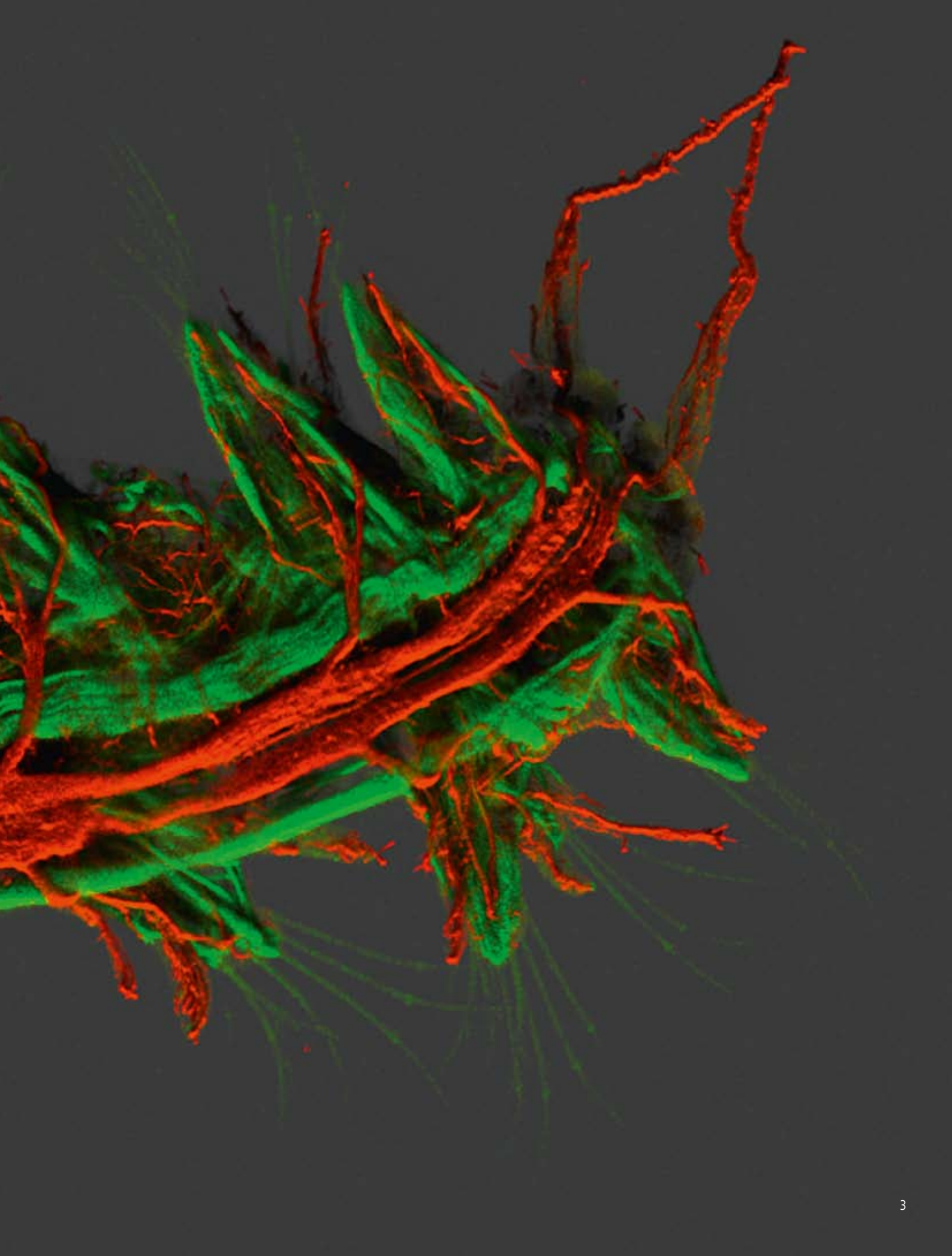
Bristle-worm, 3D reconstruction.
Red: Nervous system, stained with Alexa 555.
Green: Muscles, stained with Alexa 488





The New LSM 700 from Carl Zeiss

From a specialists' system to the high-end microscope for all – the LSM 700 represents the next big step in the evolution of confocal microscopy.

The LSM 700 is a member of the seventh generation of confocal microscopes from Carl Zeiss – a product family that is characterized throughout by a wealth of genuinely innovative ideas and technologies. Top-grade system components ensure superior performance. The LSM 700 concept combines Carl Zeiss quality, exceptional ease of operation and an attractive price level, resulting in an excellent price/performance ratio, which is evident in many details.

Tried-and-tested ZEISS quality for basic applications and complex requirements

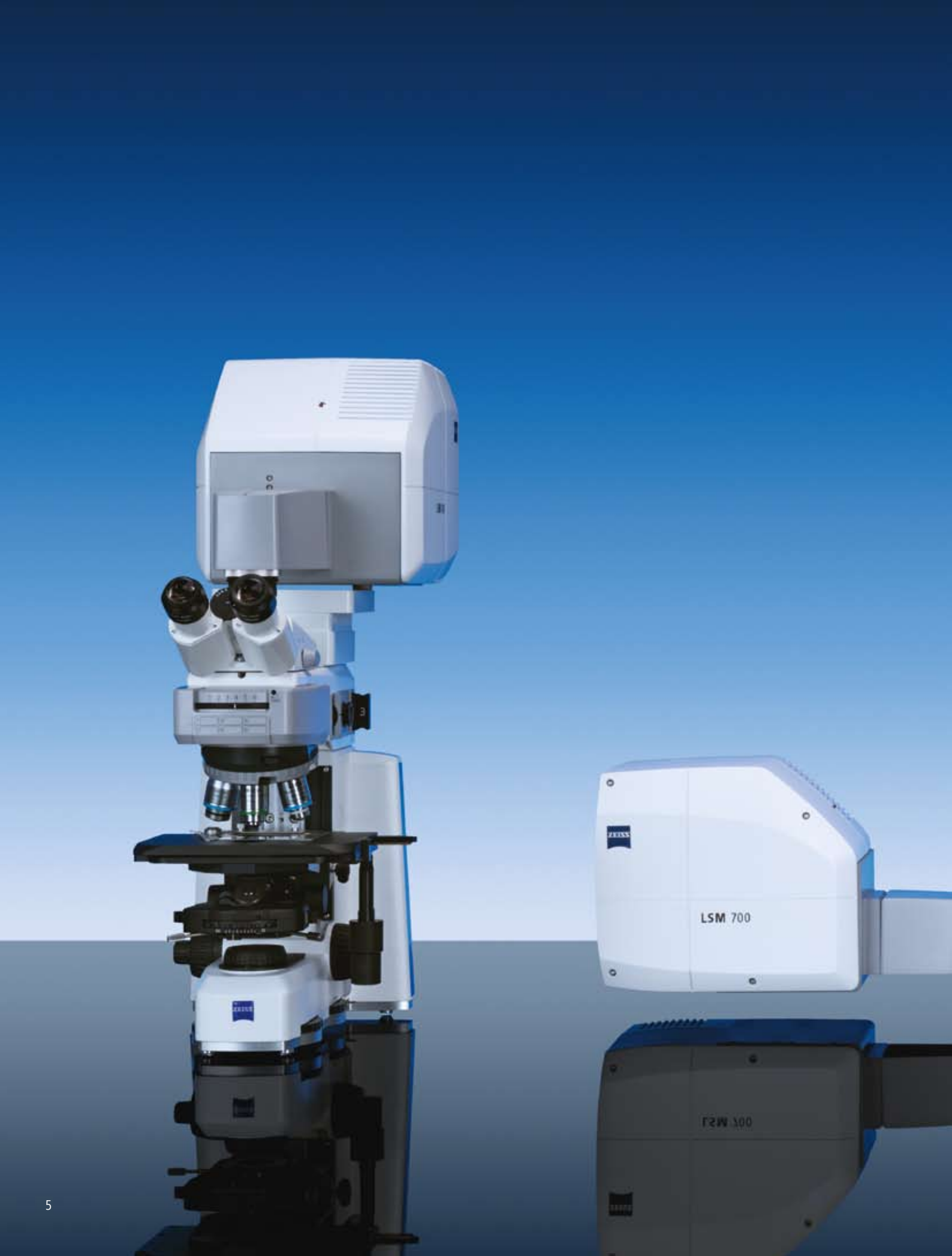
Designed for complex tasks while being easy to operate, the LSM 700 meets every challenge, whether in a single- or multiple-user environment. It fits on many different microscope stands to suit a wide range of personal or application requirements.

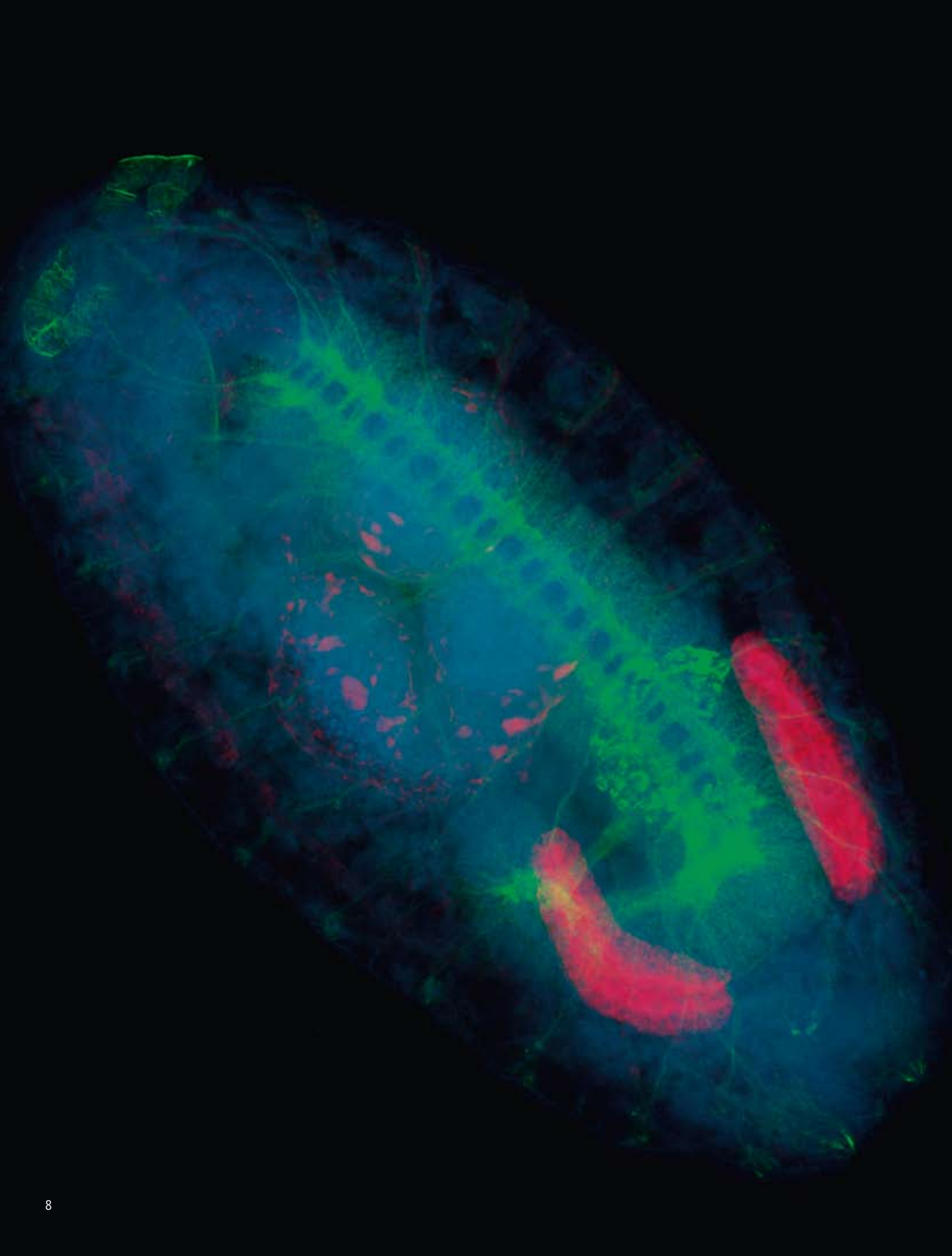
The system features outstanding sensitivity, thanks to its mature, highly corrected optics and the efficiency of its detectors and electronic components. Together with the user-friendly ZEN software the system makes up a package that is suitable for classical confocal microscopy and special applications alike, such as live cell imaging, spectral imaging and raster image correlation spectroscopy (RICS).

One image acquisition system for simple and demanding tasks

The LSM 700 is ideal for multi-user facilities, where it can complement larger systems and relieve their workload. For many users in biomedical research it will provide an entry to high-end applications previously limited to just the highest end systems.

With frame rates of up to five fps (512 x 512 pixels), a freely 360° rotatable scanning field and freely definable regions of interest (ROIs), the LSM 700 provides the experimental freedom required for many applications.


LSM 700



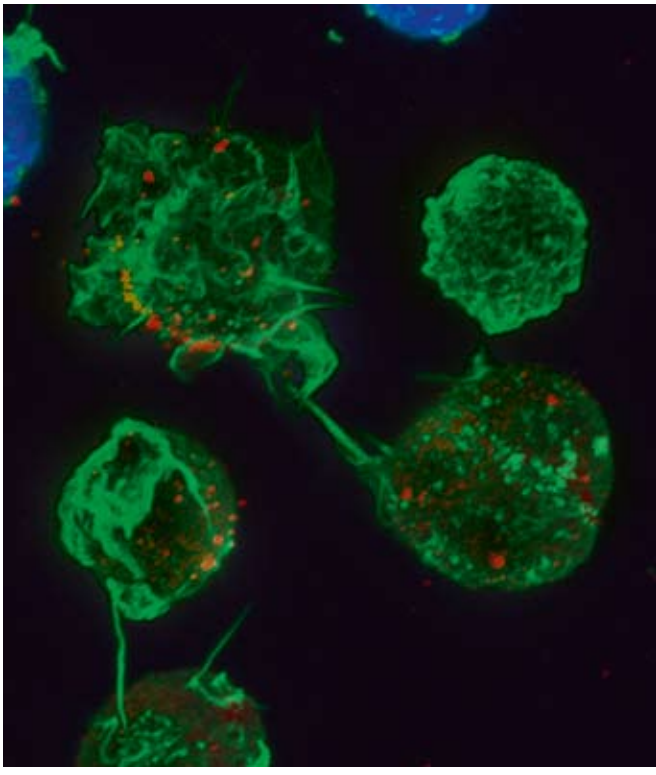
Fresh Impetus to Your Research

The LSM 700 fits many applications that are extraordinary for its price bracket. Spectral Imaging and Linear Unmixing are but two examples of techniques that demand a system of top quality.

3D imaging

3D imaging is the standard application of a laser scanning microscope. Brilliant 3D images require excellent optical quality and precisely controlled image acquisition.

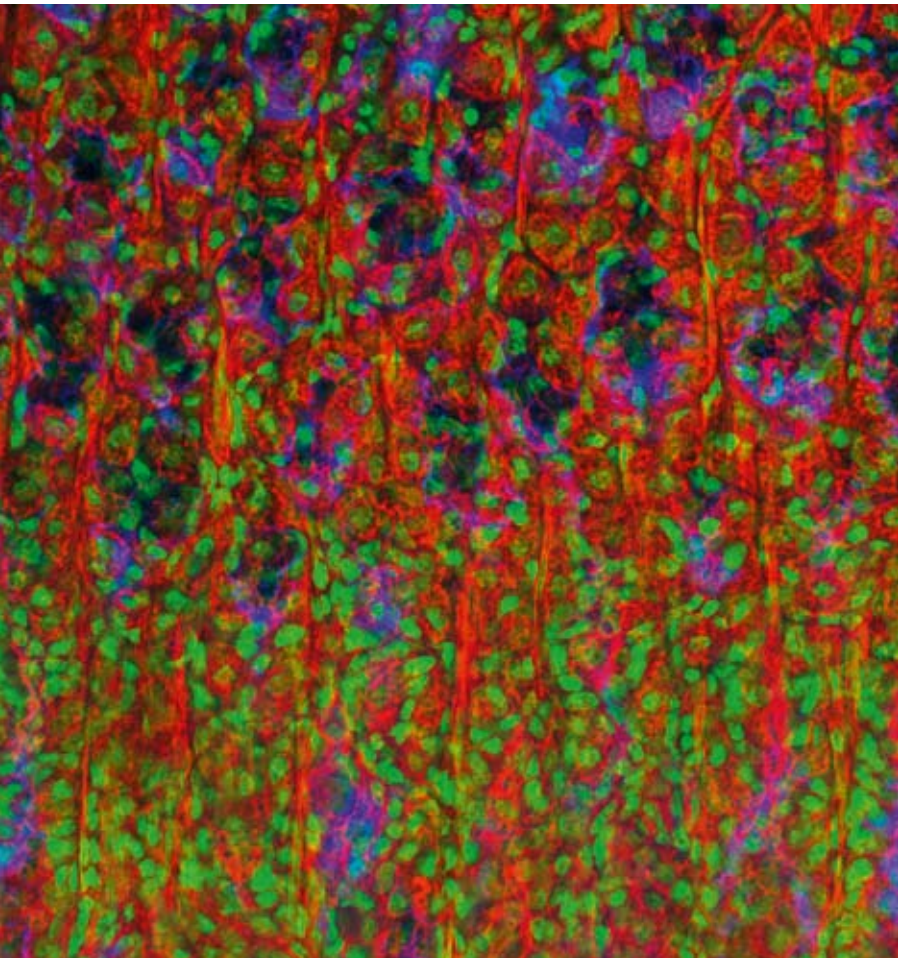
The LSM 700 assists you in configuring the acquisition parameters, from choosing the pixel resolution, via setting the diameter of the confocal pinhole to the Z spacing of the optical sections.
Subsequently image acquisition is performed automatically and fully motorized. The ZEN software reconstructs your highly resolved 3D images and meaningfully presents them, e.g., in the form of projection or animations.



Human lymphocytes transmitting the HIV virus from cell to cell. Red: HIV (Gag), Alexa 546. Green: Actin-phalloidin-Alexa 488. Blue: Cytosol marker. Domenika Rudnika Nathalie Sol-Foulon and Olivier Schwartz, Institut Pasteur, Virus and Immunity Unit, Paris, France

Drosophila Melanogaster Embryo,
Blue: DAPI. Green: Alexa 488. Red: Cy3

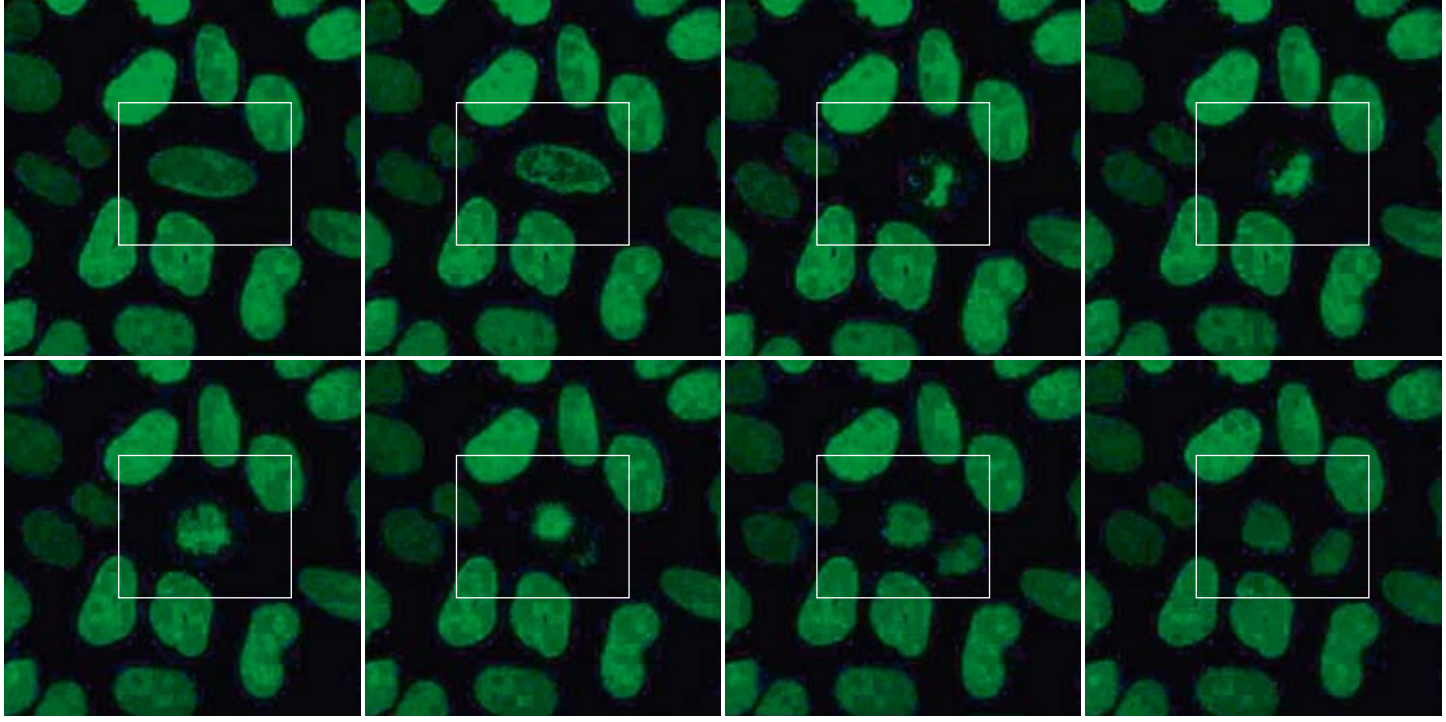
Section of a mouse stomach.
Blue: Plasma membrane, stained with Alexa Fluor 350 WGA (wheat germ agglutinin). Red: Actin, stained with Alexa 488. Green: Nuclei, stained with Sytox Green



Multiple fluorescence and colocalization analyses
In multicolor fluorescence imaging, the use of several fluorophores permits the observation of spatial relations between several cell constituents. 2 fluorescence detectors in the LSM 700 detect up to four color signals in a (quasi-)simultaneous mode, at frame rates of up to 5 fps for 512 x 512 pixels. Efficient separation of the fluorescence signals by selective laser excitation, and efficient splitting by means of the VSD (Variable Secondary Dichroic) beamsplitter prevent crosstalk and ensure unambiguous results, especially in colocalization analyses.

Emission Fingerprinting
Spectral imaging and subsequent linear unmixing precisely separate fluorescent signals even of greatly overlapping color signals – whether you use, for example, GFP and YFP simultaneously or whether broad-band autofluorescence is present.

The integration of the VSD beamsplitter into the Emission Fingerprinting concept of the LSM 700 provides an innovative, highly efficient method of spectral image acquisition. Unlike conventional sequential methods, all parts of the spectrum emitted by the specimen are utilized for determining each spectral data point.



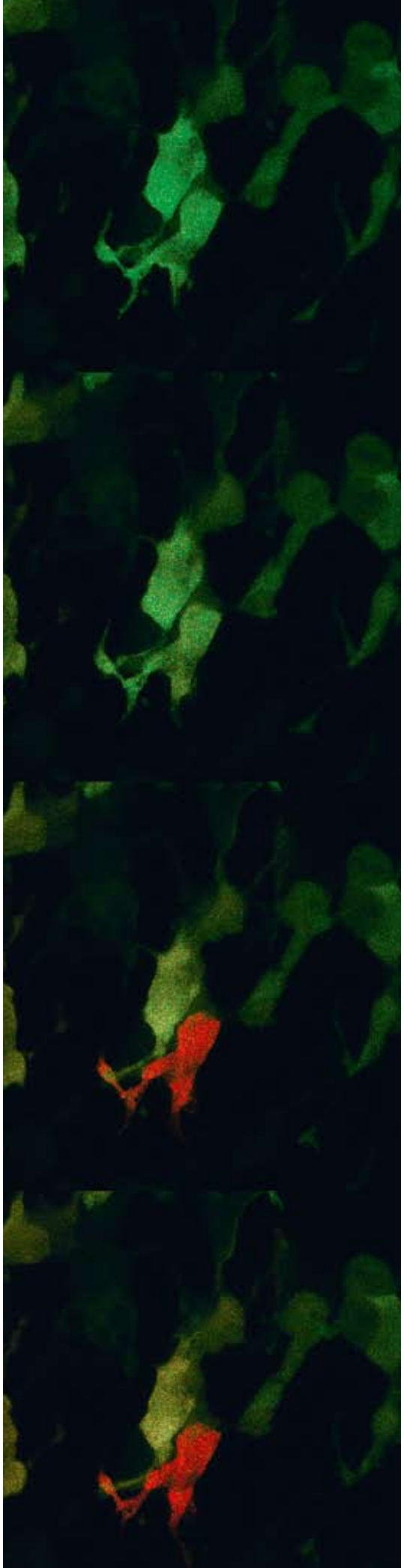
DAPI-stained nuclei and mitosis visualized in live cultured cells

Live Cell Imaging

High light intensities and long irradiation lead to phototoxic reactions in living cells and tissues. The high sensitivity of the LSM 700, combined with pixel-precise control of illumination, preserves your specimens and permits you to observe fast biological processes over long periods of time.

Ion imaging

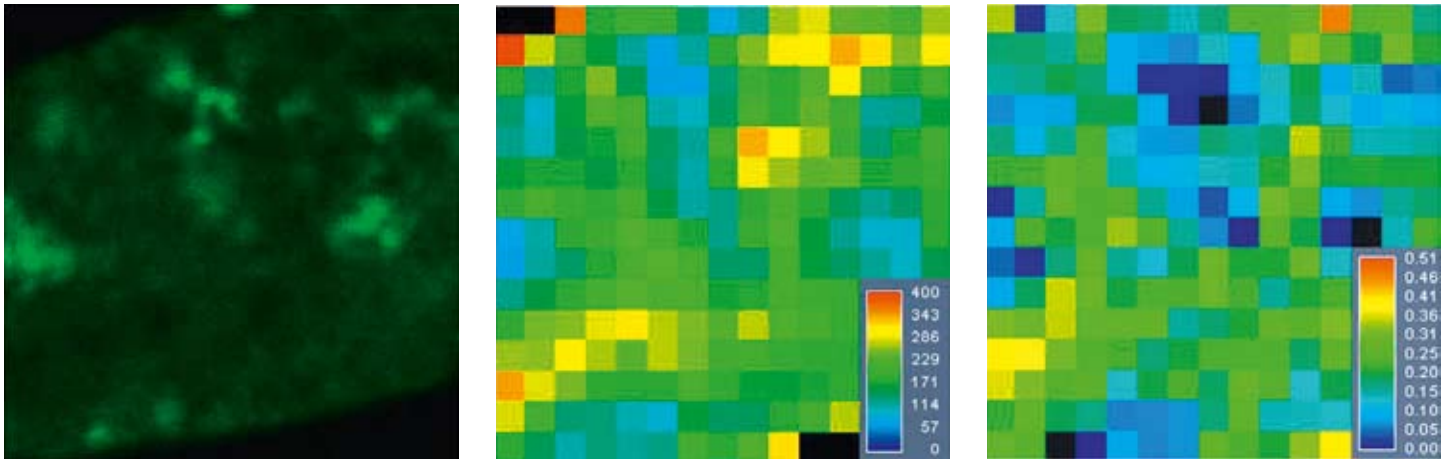
The well thought-out functions of the ZEN software support not only image acquisition but also image analysis in the observation of ion activities in live specimens. Online creation of ratiometric images allows the results of your experiments to be displayed in real time during the acquisition.



FRAP, FLIP, photoactivation and photoconversion

Transport processes in live cells and organisms can be observed by means of targeted localized photobleaching, or by means of photoactivation or color conversion of fluorophores such as PA-GFP or Kaede. Thanks to precise real-time control of the excitation laser light and scanning mirror movements in the LSM 700, pixel-precise local illumination in up to 99 regions of interest is possible, as is the change between manipulation and imaging modes within milliseconds.

Photoconversion of the fluorescent protein Kikume in a transgenic mouse embryo.
Specimen: Dr. Heather Young, Anatomy Department, University of Melbourne, Australia



EGFP-HP1 expressed in the cell nucleus of HEP-G2 cells. HP-1 is present in Euchromatin and Heterochromatin (denser structures). Average diffusion was determined to be 0.07 µm2/s by RICS. Binding to heterochromatin is tighter, which is reflected in the reduced diffusion times obvious in the diffusion map. Albeit the concentration is higher in the hetrochromatin, mobile and hence fluctuating particles are lower; hence the decrease in molecule numbers in the number map.

Sample: Karolin Klement and Peter Hemmerich, Fritz-Lipman-Insitute (FLI), Jena, Germany

RICS *Raster Image Correlation Spectroscopy*

From images of live cells an analytical tool of the ZEN software derives quantitative information on the concentration and mobility of labeled molecules. Short image sequences acquired with the LSM 700 are sufficient to establish molecule diffusion coefficients or molecule numbers in various cell compartments.

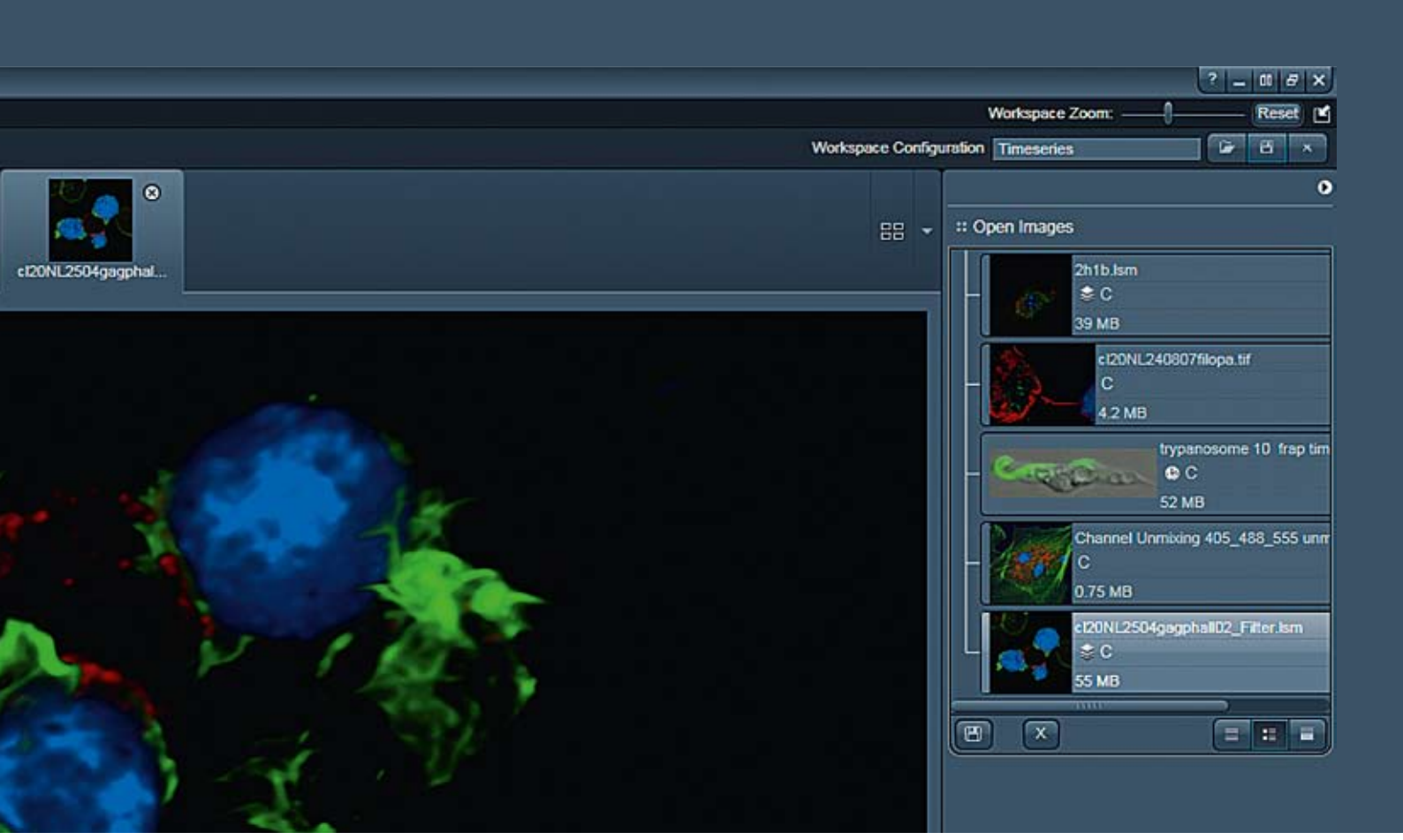
The Ingenious, but Easy Way: ZEN – the Software for the LSM 700

ZEN makes life with confocal laser scanning microscopy easier for you. After a short period of familiarization with the intuitive user interface you are ready to go.

ZEN Efficient Navigation is the software that now comes with all Carl Zeiss confocal LSM systems. Easy to operate, ZEN offers a wide range of capabilities. It controls highly complex LSM techniques (e.g., FRAP or RICS) with the same dependability as it does classical confocal applications. The current ZEN version, specially tailored to the LSM 700, allows you to concentrate on your experiments rather than on the microscope software.

Navigation the easy way

The color scheme of the ZEN user interface matches the lighting conditions in a lab environment so as to be easy on the eye. The three-zone layout reflects the typical work process: Left Tool Area with the tools for image acquisition and microscope control, Central Screen Area for image viewing and Right Tool Area for file management. The screen area is freely scaleable to improve readability from a distance.



Made to Measure for Each Individual User

Configure the user interface of ZEN to suit your personal preferences or a particular experiment.

In the Central Screen Area of the ZEN user interface up to three image containers can be opened at any time to compare images side by side. In each container you can separately select between modes of presentation of the acquired data. The tools to do this with are View Control Panels with functions such as 3D, colocalization, RICS, 3D section *(Cut View)* or orthogonal section *(Ortho View).*

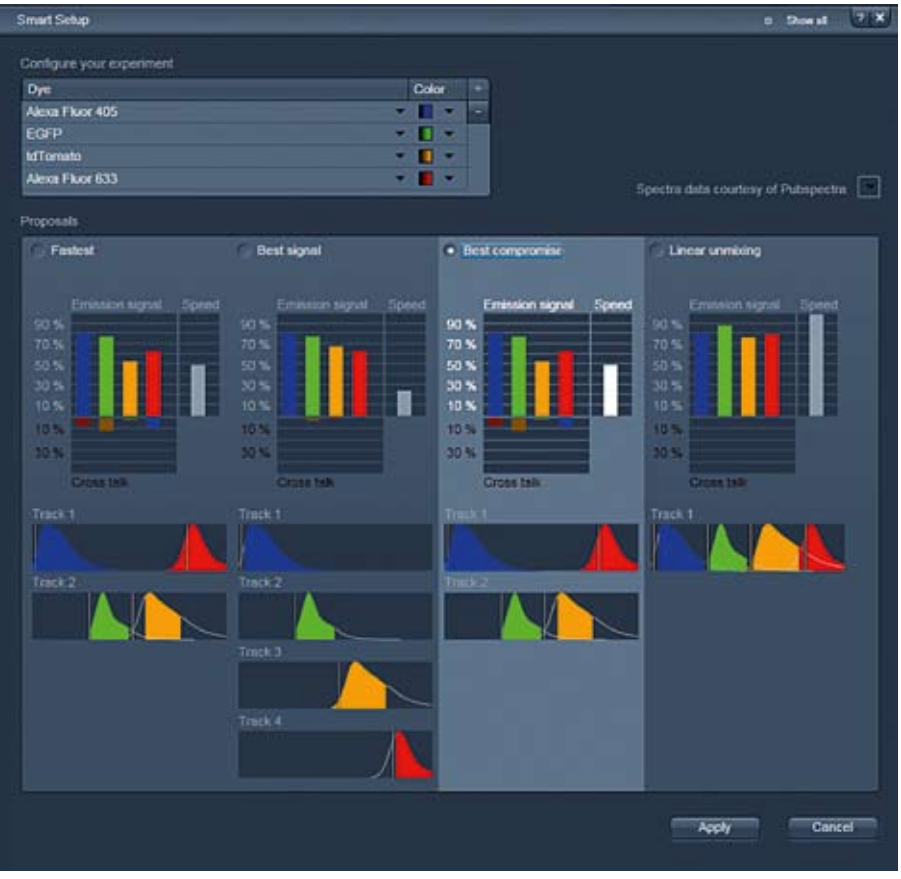
In the Exposé Mode all images opened in the image containers are shown side by side like slides. This gives you a clear overview and facilitates navigation among the images opened. The Right Tool Area shows all images opened, together with concise information on size, image type, etc. providing a quick overview of the images acquired; this overview can be switched on or off.

Flexible tool windows for personalized work

ZEN has been conceived to allow you to compile your individual set of functions. Thanks to rarely used features being hidden unless you decide to "show all", your tool windows are never more complex than necessary. You only see the functions you need. Moreover, you can place the tool windows in any position on the monitor screen, and save the software layout required for each individual work procedure. Thus you can start your next session with the identical settings right away – an ideal feature especially if you share the LSM 700 with others.

Special ZEN Functions for the LSM 700 that Make Your Job Easier

ZEN makes it possible for you to focus entirely on the essential.



Smart Setup

The **Smart Setup** tool is one of the functions that will make your work with the LSM 700 incredibly convenient. Even without in-depth knowledge of LSM, you can use it to set your microscope for optimum image acquisition within the shortest possible time. Simply select the fluorescent dyes in your specimen from a list and choose one of four image acquisition strategies (Best Signal, Fastest, Best Compromise or Linear Unmixing). The system then automatically changes all the required settings of the LSM. Click on the start button, and see the first images.

Choice of control tools

The software provides easy control of all the technical features of the LSM 700. Via interactive navigation you can also select applications such as colocalization, RICS, unmixing, bleaching or time series.

For a detailed description of these and other functions and techniques possible with the LSM 700, see www.Zeiss.de/ZEN.

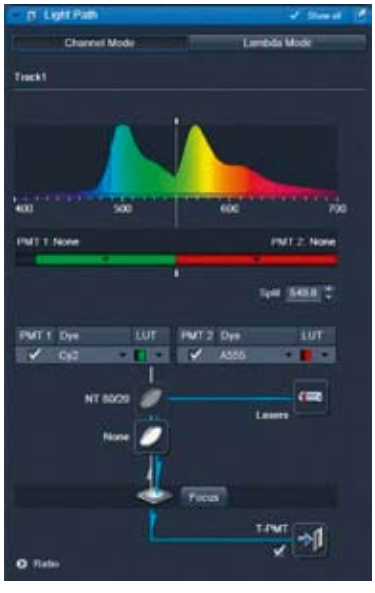
Stage
A software joystick supports the control of the motorized XY scanning stage.

Z-Stack
Use this module to configure the acquisition of image Z stacks. The software controls the Z movement of the microscope at the correct intervals and synchronizes its movements with image acquisition. Step sizes can be computed automatically or determined interactively. If you want to check the settings made before starting your experiment (e.g., for Z stacks versus time), a graph will provide an informative overview.

Light Path
With this function you can select the position of the VSD beamsplitter, and thus, the desired detection range. Do this interactively, or automatically with the Smart Setup tool.

Stage

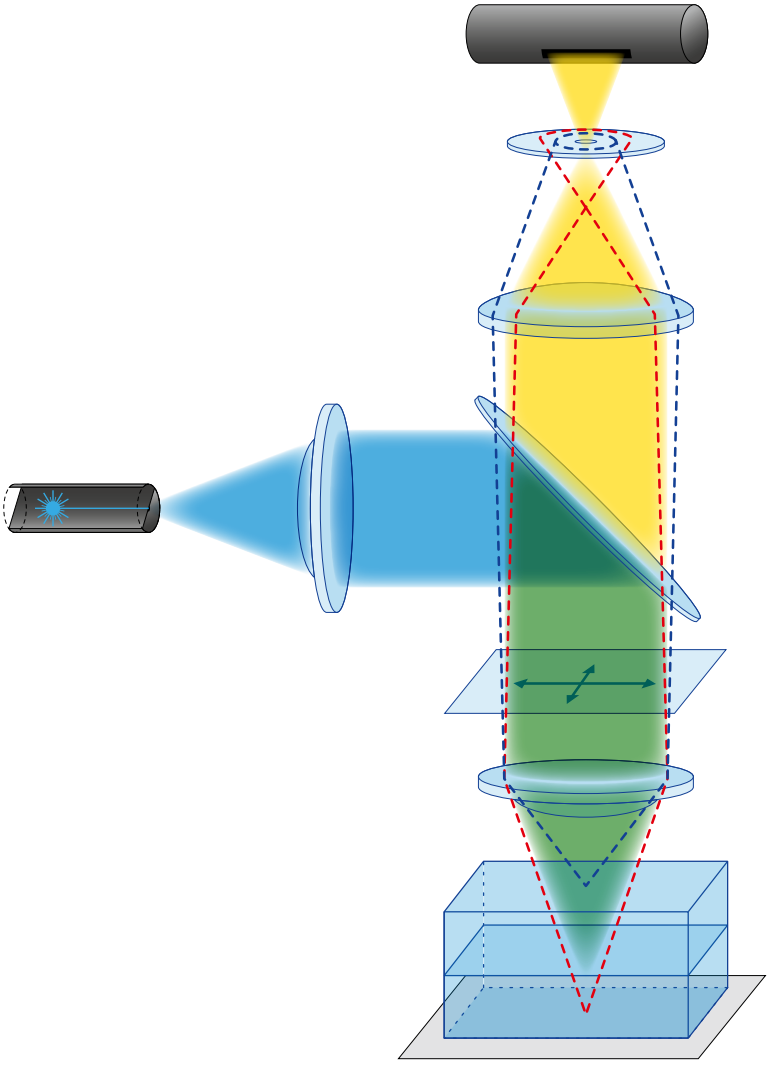
Z Stack



Light Path

Confocal Microscopy – 3D Imaging of Objects

Confocal Laser Scanning Microscopy: Sharp three-dimensional images – even of thick specimens.



In the mid-17th century, biologists and doctors enthusiastically welcomed the first microscopes, which led to an enormous leap in their research. Three centuries later, scientists were amazed again: The arrival of confocal microscopy in 1957 opened up a new dimension. Instead of 2D images affected by out-of-focus light, the invention made possible the imaging of extended three-dimensional specimens with excellent depth discrimination. In 1982, Carl Zeiss launched the first commercially available laser scanning microscope (LSM) – a microscope system with a laser beam scanning the specimen, and electronic image processing.

Beam path in the confocal microscope

LSM: Point-size illumination – point-size observation

Unlike classical microscopes, confocal laser scanning microscopes feature a confocal **pinhole aperture** positioned in the beam path and conjugate with the illumination focus. Its diameter can be varied so as to ensure that the detector receives light exclusively from the focal plane. Light from zones above or below the focal plane is rejected, which increases the definition of the image.

In the conventional light microscope transformation from the object to the image takes place simultaneously (in parallel) for all object points, whereas the confocal laser scanning microscope scans the specimen in a point-by-point mode. A digital image processing system assembles the image points (voxels) thus creating a 2D image, known as an optical section. Several optical sections, taken along the microscope's Z axis, form a Z stack, which the computer then converts into a 3D image with an extended depth of focus.

The advantages at a glance:

Confocal laser scanning microscopy

- Captures images of three-dimensional objects with high spatial and temporal resolution
- Permits studies of intra- and extracellular molecular movements in live cells
- Permits many modern techniques such as pixel-precise photomanipulation for localized bleaching or photoactivation

Every Photon Counts – the LSM 700 Beam Path

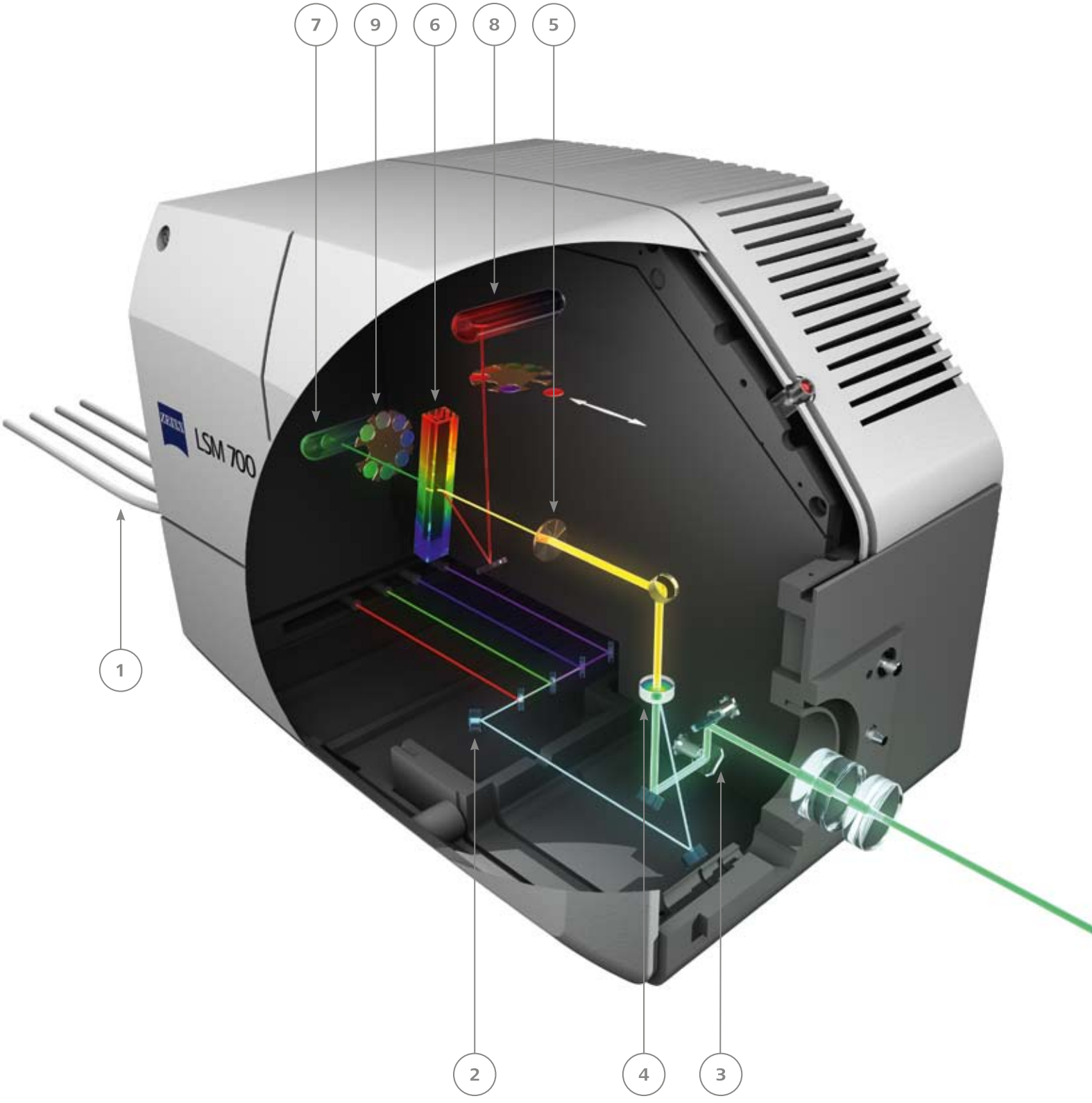
In the scanning module, light rays are guided from the sample to the detectors with the absolute minimum loss. This gives the LSM 700 its high sensitivity.

High sensitivity of the LSM 700 is guaranteed by the sophisticated, innovative optical design by Carl Zeiss, which conducts the light emitted by the specimen onto the detectors with next to no photon loss.

This is the path of light rays from the source to the detectors in the LSM 700 scanning module: Excitation light from up to four lasers is coupled into the scanning module via optical fibers (1). It falls on the beam-combining mirror cascade (2), where it is centered and aligned with the optical axis. Two scanning galvanometer mirrors (3) direct the light onto the specimen, which is scanned by the light beam in a point-by-point mode.

The fluorescent light emitted by the specimen is contaminated by a small amount of reflected laser light; this is efficiently blocked by the FixGate main beamsplitter (4). The remaining emission light is directed through the fully automatic, high-precision pinhole (5), which exclusively allows fluorescent light originating from the objective's focal plane to pass. This reaches another beamsplitter (6), where it is split up and directed onto the two detectors PMT1 (7) and PMT2 (8). From the signals they detect, the computer assembles an electronic 3D image. Filters (9) may optionally be positioned in the beam path between the VSD beamsplitter and the detectors.

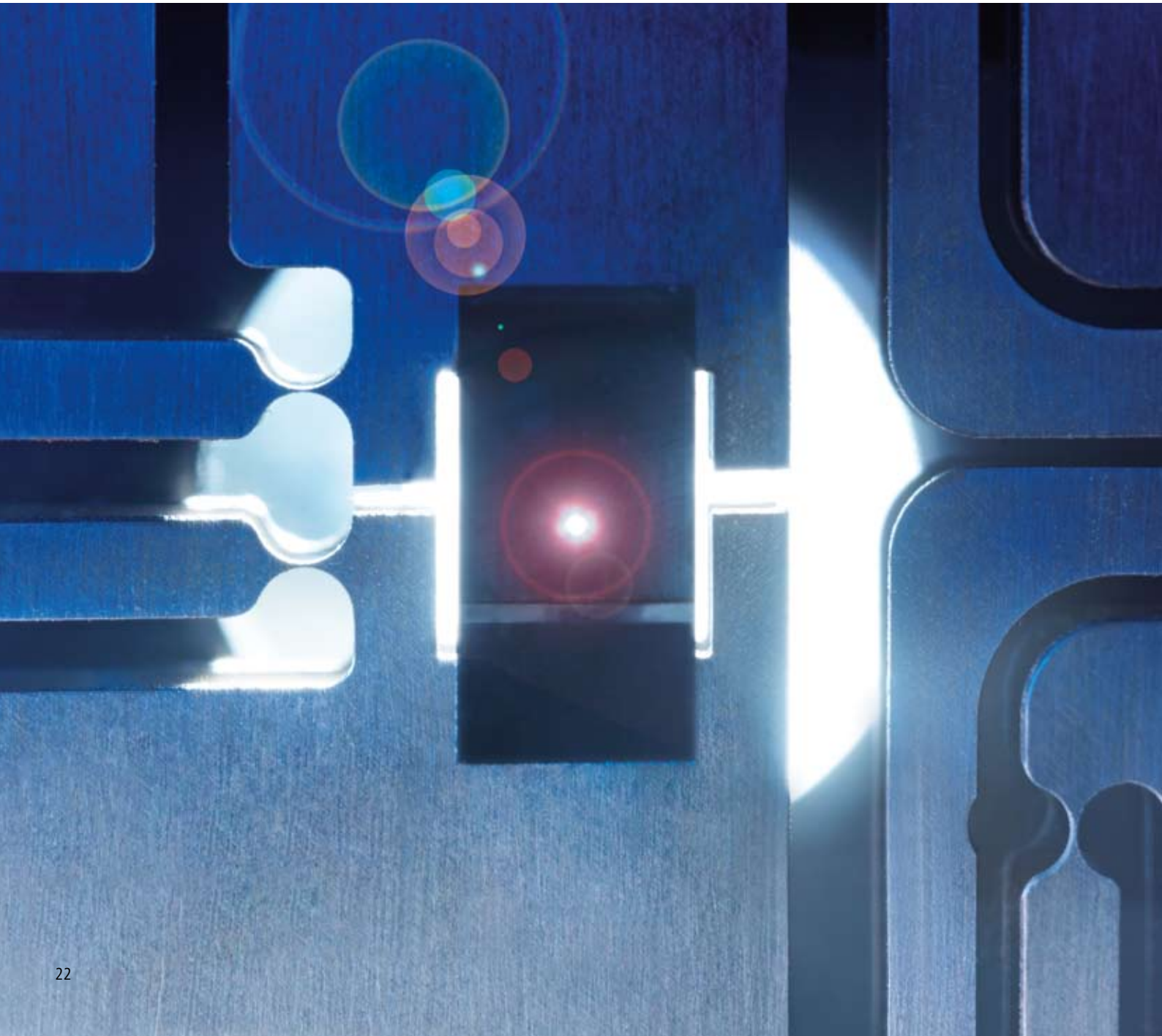
The scanning module can be combined with a wide range of Carl Zeiss microscopes.



Beam path of the LSM 700 scanning module

High Flexibility, Reproducibility and Sensitivity; Excellent Optical Quality

The LSM 700 is characterized by four technical innovations: The VSD beamsplitter provides flexibility of detection. The motor-controlled precision pinhole ensures the best possible reproducibility. PTC lasers, the beam-combining mirror cascade and the FixGate main beamsplitter contribute to the system's excellent optical quality.

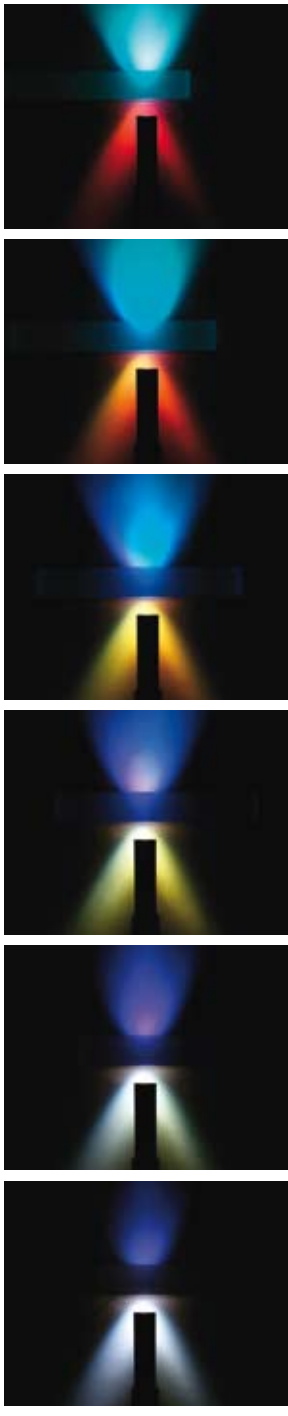


The precision pinhole
An item of top Carl Zeiss quality, this pinhole is completely controlled by motors, which can continuously vary its aperture and position and automatically adjust it to any of several illumination and detection wavelengths you may work with. Thus, the optical slice thickness in multiple fluorescence experiments is optimally set for each wavelength, an essential requirement for colocalization measurements.

The VSD beamsplitter: Full flexibility in choosing the detection range
The VSD beamsplitter is the core of the LSM 700 – an optical element with which the emission light can be split between the system's two detectors, the split being continuously spectrally variable. This lets you freely select the detection range. You can flexibly adapt the detection window to your fluorochromes, rather than being tied to wavelength ranges dictated by filters.

The VSD beamsplitter is highly efficient with regard to photon yield. Unlike conventional systems, where the light is filtered and some of it is always lost, the VSD directs the incident photons onto one of the two detectors with no loss.

The VSD beamsplitter further permits the acquisition of spectrally resolved image series known as lambda stacks. These are prerequisite to optimum results in the separation of dyes of overlapping colors by means of the Emission Fingerprinting technique introduced by Carl Zeiss.



The incident emission light is split into variable shares by the VSD.

Pinhole

FixGate main beamsplitter

Thanks to its special geometric arrangement, the FixGate main beamsplitter separates the fluorescent signal returned by the specimen from the excitation radiation with great efficiency. The resultant superb laser blocking in the LSM 700 permits imaging of even the faintest fluorescence signals in critical specimens.

PTC lasers and mirror cascade

The LSM 700 operates with up to four stable solid-state lasers (405/444, 488, 555 and 639 nm). Each of them is connected to the scanning module by a separate optical fiber and a precision connector (PTC pigtail concept). This replaces large laser modules and substantially reduces the space occupied by the LSM 700. The mirror cascade in the scanning module directs all excitation wavelengths onto the system's optical axis – precisely and color-corrected. These components are responsible for the excellent optical quality of the LSM 700.

As the precision connectors need no adjustment, lasers can be retrofitted to the LSM 700 in the lab within a few minutes. But this is not the only feature to make the system so easy to use: The laser module is very small compared to others, hence the LSM 700 has a small footprint and needs no special, bulky antivibration table.

Further technical features of the LSM 700

Laser Life Extender

If any of the lasers of the LSM 700 is not used for more than 15 minutes, it is switched off automatically. This considerably prolongs the service life of the laser diodes and cuts the system's maintenance costs.

ReUse function

If you want to repeat an earlier experiment with the identical acquisition parameters, the ReUse function lets you exactly reset the same parameters with a single mouse click.

Calibration objective and System Maintenance Tool

The optional calibration objective and the System Maintenance Tool (SMT) adjust and calibrate the LSM 700 fully automatically. A few mouse clicks suffice to restore your LSM 700 to its optimum settings for high-precision experiments within less than 30 minutes.

Real-time electronics

The control unit controls and coordinates the LSM 700 in real time, enabling experiments that require the system to operate with absolute precision and high speed, such as bleaching with single-pixel accuracy, local photoactivation, scanning of up to 99 freely definable regions of interest (ROIs), or scanning along a freely defined line.

PTC laser concept with precision connectors

The LSM 700 Facilitates Your Research

Sophisticated and yet robust technologies, an easy-to-operate, intuitive software and simple configuration for experiments make the LSM 700 the genuine workhorse of a research team – whether as a basic confocal system or as a supplement to existing LSM systems.

The LSM 700 is especially suitable for…

…service providers who want to make one LSM system available to several users:

- Calibration objective and System Maintenance Tool permit quick and easy calibration by every system manager.
- The intuitive ZEN software not only shortens the training period for novices but also saves the workstation settings of each user and thus makes experiments reproducible.
- The Laser Life Extender helps save costs.
- Thanks to its small size, the LSM 700 can easily be accommodated even in a cramped lab environment.

With its compact design, small footprint, and high quality optics the LSM 700 is ideal for imaging facilities where laboratory space is at premium. Further, the automated maintenance protocols ensure that imaging performance can be verified by users. The training is largely facilitated with the new ZEN environment where all functions are in a single window.

Dr. Spencer Shorte
Imaging Facility Manager

With "Smart Setup" acquisition protocols are designed by selecting fluorophore spectra from a database. Users can then choose the best compromise between speed and good spectral detection, simply by telling the ZEN software what overall performance criteria they wish to achieve and "Smart Setup" does the rest. With this feature training new users could not have been made any simpler.

Dr. Emanuelle Perret
Scientific Staff

The optics design of the LSM 700 enables a wide variety of confocal applications. Sophisticated tasks, like spectral acquisition, are achieved very easily; all with excellent image quality and rapid scan speed. Molecular parameters such as diffusion can be acquired using Imaging Correlation Spectroscopy. The LSM 700 provides much of the functionality and performance usually restricted to higher priced systems.

Dr. Pascal Roux
Scientific Staff

...users who plan ambitious experiments and need a highly sensitive, absolutely precise LSM system:

- The fully automatic pinhole ensures precision in multiple fluorescence work.
- Software options facilitate techniques such as FRAP, FRET, FLIP or RICS
- The system's sensitivity permits fast, specimen-preserving scanning.

...users who want fast results without in-depth study of laser scanning microscopy:

- The intuitive ZEN software almost explains itself and the system capabilities.
- The Smart Setup concept allows straightforward configuration. The first images are obtained quickly. The impressive results are ideal for publications.
- Images of excellent quality thanks to high-grade optics and electronics – a matter of course with a Carl Zeiss product.

This is the most compact Laser Scanning Microscope system I have ever seen, the image quality has not been compromised. Moreover the footprint of the system is so small it could fit into any lab.

Dr. Dave Spiller
Principal Experimental Officer

The LSM 700 surpassed my expectations of a "basic" LSM. I found it extremely competent and able to perform most applications with ease. The real bonus is that the system is extremely sensitive and capable of imaging almost any probe. From a multiuser perspective, with the ZEN software my users would not need to be trained on the basic operations and can easily move between systems.

Dr. Peter O'Toole
Head of Imaging Department

Dr. Spencer Shorte
Dr. Emanuelle Perret
Dr. Pascal Roux
Plate Forme d'Imagerie Dynamique

Dr. Peter O'Toole
Head of Imaging and Cytometry Technological Facility

Dr. Dave Spiller
School of Biological Sciences
Center for Cell Imaging

Specification LSM 700

Microscopes	
Upright stands	Axio Imager.Z1, Axio Imager.M1, Axio Examiner, Axio Scope mot for LSM
Inverted stands	Axio Observer.Z1 (SP) Axiovert 200M (SP)
Z drive, smallest increment	Axio Imager.Z1, Axio Imager.M1, Axio Observer.Z1: < 25 nm; Axio Examiner: < 30 nm; fast piezo objective or stage focus accessory; Definite Focus for inverted microscopes; XY stage, option: motorized XY scanning stage, with Mark & Find function (XYZ) and tile (mosaic) scan
Accessories	AxioCam digital microscope camera; integration of incubation chambers

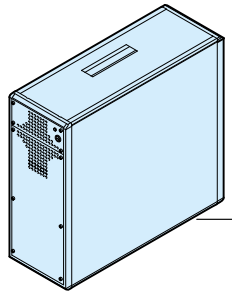
Scanning module	
Scanning module	1 or 2 reflection/fluorescence (R/FL) detection channels, each with highly sensitive PMT detectors, prepared for lasers of wavelengths 405, 445, 488, 555 and 639 nm; option: 1 external transmitted-light channel (DIC-capable)
Scanners	Two independent galvanometer mirrors with ultrashort line and frame flyback
Scan resolution	4 × 1 up to 2048 x 2048 pixels, also for two channels, continuously variable
Scan speed	Up to 5 fps of 512 x 512 pixels (and, e.g., 27 fps with 512 x 96 pixels, or 154 fps with 512 x 32 pixels) in two channels, selection of 26 speed levels
Line scan mode	Scaleable from 4 to 2600 lines/s with 512x1 pixels
Scan zoom	0.5x to 40x, digitally variable by increments of 0.1
Scan rotation	Free 360° rotation, variable by increments of 1°, free XY offset
Scan field	18 mm field diagonal (max.) in the intermediate image plane, with full pupil illumination
Pinhole	Motorized master pinhole, continuously variable diameter
Beam conduction	Main color beamsplitter, outstanding laser line suppression
Spectral detection	Simultaneously in two confocal reflection channels, with high-sensitivity, low-noise PMTs, adjustable (increment 1 nm)
Data depth	Selectable between 8, 12 and 16 bit

Laser modules	
Laser modules (VIS, V)	Pigtail-coupled solid-state lasers with polarization-preserving single-mode fibers; up to 4 V/VIS lasers directly connectable to the scanning module
Laser lines	405 nm 5 mW or 445 nm 5 mW; 488 nm 10 mW; 555 nm 10 mW; 639 nm 5 mW (each at the fiber output end). Fast (pixel-precise) individually variable intensity setting of all laser lines (direct modulation). Automatic power down of lasers not in use

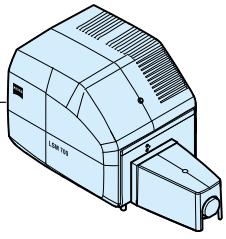
Electronics module	
	Real-time electronics integrated in PC; communication with PC via PCI Express
	Control of microscope, lasers, scanning module and accessory components; monitoring of data acquisition and synchronization
	Oversampling read-out logics for best sensitivity and twice the SNR; online data extraction possible already during image acquisition
	User PC generously equipped with main memory and hard-disk capacity; ergonomic, high-resolution 16:10 TFT flat-panel display
	Many accessories; Windows VISTA operating system, multi-user capability
	Ethernet connection to local area network

Standard software ZEN	
	Configuration of all motorized functions of microscope, scanning module and lasers Configurable and savable workspace (user interface) Saving and restitution of application-specific configurations (ReUse)
	System self-test: Calibrating and testing tool for automatic system checking and adjustment
	Smart Setup; Automatic setting of the system according to a selection of dyes
	Acquisition modes: Spot, Line/Spline, Frame, Z stack, Lambda Stack, Time Series and all combinations (XYZ | t)
	Online computation and presentation of ratio images; averaging and summation (linewise, framewise, configurable), Step Scan (for higher frame rates)
	Crop function: Convenient selection of scan areas (zoom, offset, rotation simultaneously); RealROI Scan, Spline Scan, scan of up to 99 ROIs of any shape, pixel-precise laser blanking; scan along a freely defined line
	ROI Bleach: Localized bleaching in up to 99 bleaching-ROIs for applications such as FRAP or Uncaging; use of different speeds for bleaching and image acquisition, use of different laser lines for different ROIs.
	Multitracking: Fast change of excitation lines when acquiring multiple fluorescences, for minimizing signal crosstalk Lambda Scan: Sequential acquisition of image stacks with spectral information for every pixel Linear Unmixing: Generation of crosstalk-free multifluorescence images with simultaneous excitation; online or offline unmixing, automatically or interactively; advanced unmixing logic with reliability statement
	Presentation: XY, Orthogonal (XY, XZ, YZ), Cut (3D section), 2.5D for time series of line scans

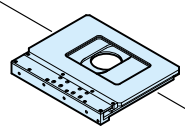
System Overview LSM 700



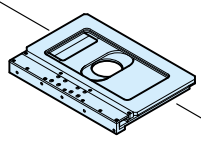
Electronics and laser module
for LSM 700
(4x pigtailed laser 405-639 nm)



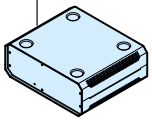
1-2-channel scanning module LSM 700



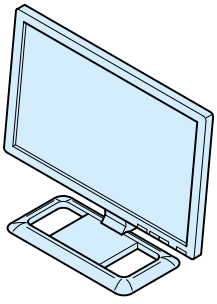
Scanning stage 130x85 PIEZO
for upright stand



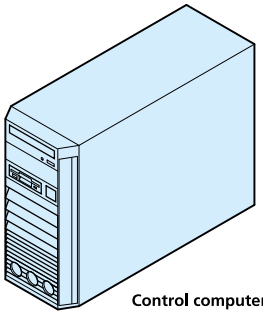
Scanning stage 225x85 PIEZO
for upright stand



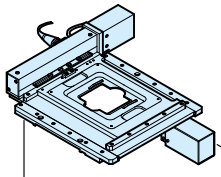
XY-stage controller PIEZO
XY-joystick
for stage controller PIEZO



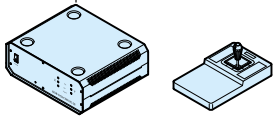
LCD TFT flat screen monitor 30"
16:10 flat screen monitor 24"



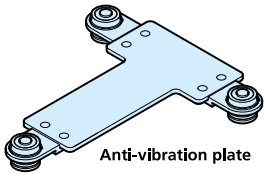
Control computer



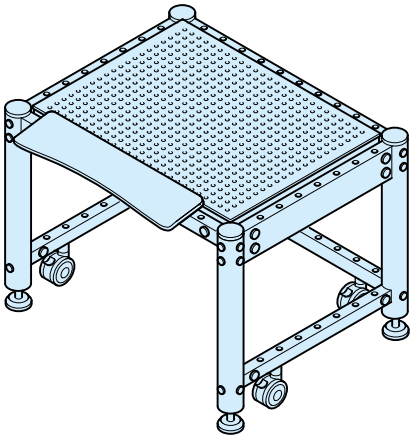
Scanning stage DC 120 x 100
for inverted stand



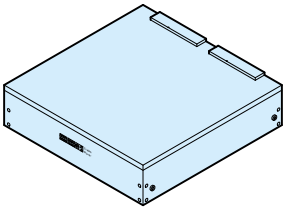
Controller incl. joystick



Anti-vibration plate



System table with breadboard
Wide: 1000x750mm (1200x950 overall)
Narrow: 750x1000mm (950x1200 overall)



MOD-1M active antivibration system
table surface: 40 cm x 40 cm

MOD-1L active antivibration system
table surface: 60 cm x 60 cm

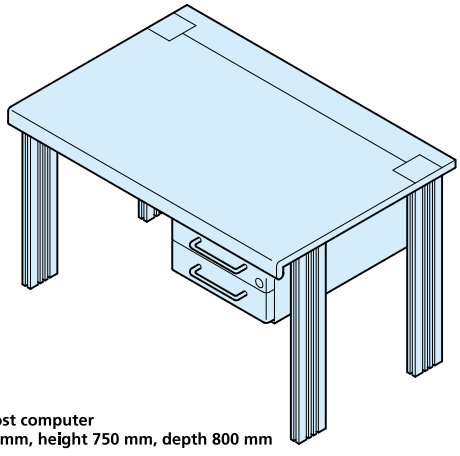
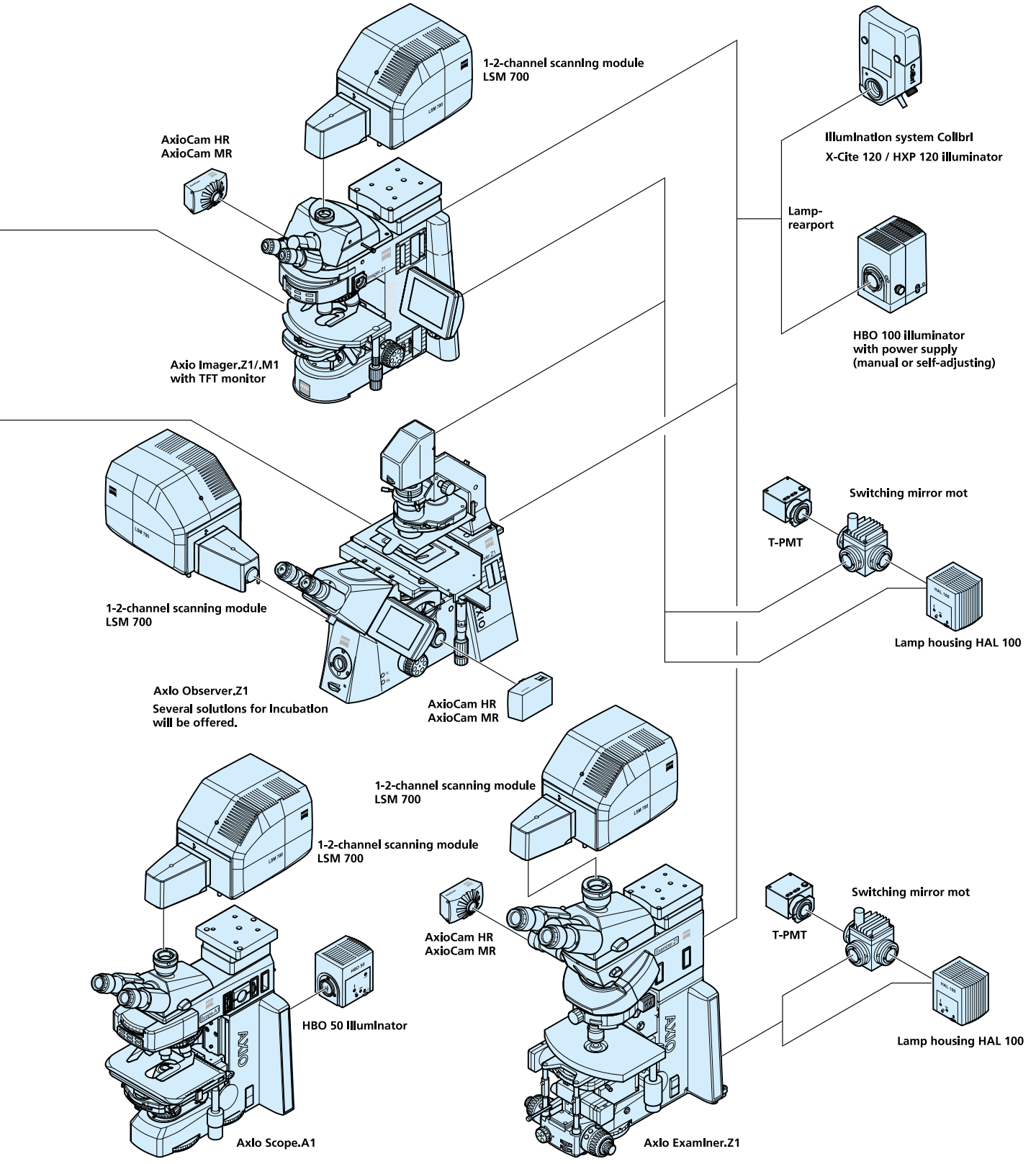


Table for host computer
width 1200 mm, height 750 mm, depth 800 mm


1-2-channel scanning module
LSM 700
AxioCam HR
AxioCam MR
Illumination system Colibri
X-Cite 120 / HXP 120 illuminator
Lamp-
rearport
HBO 100 illuminator
with power supply
(manual or self-adjusting)
Axio Imager.Z1/.M1
with TFT monitor
Switching mirror mot
T-PMT
1-2-channel scanning module
LSM 700
Lamp housing HAL 100
Axio Observer.Z1
Several solutions for Incubation
will be offered.
AxioCam HR
AxioCam MR
1-2-channel scanning module
LSM 700
1-2-channel scanning module
LSM 700
Switching mirror mot
T-PMT
AxioCam HR
AxioCam MR
HBO 50 Illuminator
Lamp housing HAL 100
Axio Scope.A1
Axio Examiner.Z1

Wide Variety of LSM 700 Configurations

Combined with tried-and-approved Carl Zeiss microscope stands, the LSM 700 is ready for a broad spectrum of applications.

Start small, end up great: Upgrade your Carl Zeiss System to suit increasingly demanding requirements.

The LSM on the inverted Axio Observer
is the ideal combination for live cell observation and quantitative imaging.

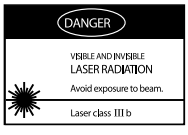
The LSM on the upright Axio Imager
is excellently suited for the examination of tissues.

The LSM on the Axio Examiner
is the best solution for cell manipulation and physiology.

The LSM on the Axio Scope
is just perfect for routine applications.

The LSM 700 retrofits **to the inverted Axiovert 200M.**

For patents, see
www.zeiss.de/micro-patents



The LSM 700 is ...

confocal
The 1- or 2-channel confocal system is fit for many applications (3D, multiple fluorescence, live cell imaging and many more).

sensitive
A new, intelligently constructed beam path ensures maximum sensitivity.

spectral
The VSD beamsplitter implements an innovative spectral detection principle.

flexible
The VSD beamsplitter is continuously variable, providing flexible selection of detection bands.

future-oriented
Integration of up to four solid-state lasers and the Laser Life Extender technology make the LSM 700 a future-oriented investment.

expandable
Lasers or a second detection channel can be readily retrofitted, and the LSM 700 fits a variety of Carl Zeiss microscope stands (Axio Scope, Axio Examiner, Axio Imager, Axio Observer, Axiovert 200M), which makes the system scaleable to satisfy the most exacting research requirements.

space-saving
The compact setup fits onto many standard worktables.

intuitive
Easy operation via the ZEN software and the Smart Setup function allow the LSM 700 to be used intuitively after significantly shorter training times.

modern
Modern technology features permit the application of new imaging techniques such as RICS.

fast
Thanks to new real-time control, the LSM 700 is a fast system which can be used with flexible scanning strategies.

Quality
from Carl Zeiss – at an attractive price/performance ratio.

The Carl Zeiss LSM 700 Laser Scanning Microscope sets a new standard in confocal microscopy. Based on tried-and-tested technology concepts, it offers innovative solutions for image analyses of extraordinary sensitivity and quality; at a very attractive price/performance ratio. The LSM 700 is distinguished by high flexibility with regard to applications and system configuration. Applications range from simple routine examinations to multidimensional image acquisition in biomedical research. The system can be combined with many microscope stands and tailored to specific user requirements. This also makes it ideal for users entering confocal microscopy.

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