



CONVIVO from ZEISS
Confocal Endomicroscope



Putting in vivo cellular imaging at your fingertips.

ZEISS CONVIVO

Curious to see what possibilities are developing in the field of cellular imaging?

The **Confocal Endomicroscope – CONVIVO®** from **ZEISS**¹ employs a powerful visualization technology that may help to support the resection of brain tumors in the future.

For the first time neurosurgeons are able to visualize cellular tissue structures without the need for tissue extraction. The innovative Confocal Endomicroscope enables **Real-Time Visualization** of tissue micro-structure and allows for checking a **Virtually Unlimited Number of Samples** in situ. Gained insights can be saved as **Digital Images** and can be provided for flexible data analysis – **anytime, anywhere.**

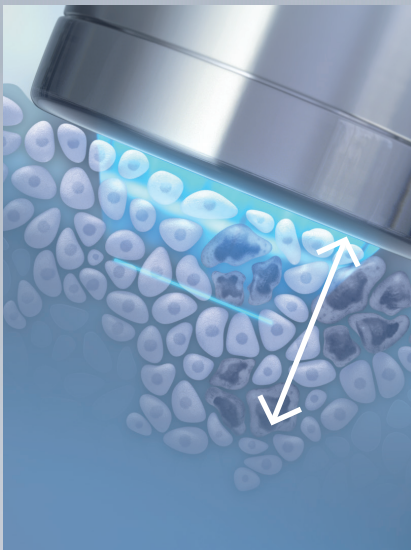
¹ ZEISS CONVIVO is a class 3R laser product in compliance with IEC60825-1.

Visualize tissue microstructure in real-time.

ZEISS CONVIVO utilizes confocal laser endomicroscopy, which is based on a scanning mechanism miniaturized into the probe tip. This allows you to seamlessly integrate imaging of cellular structures into the surgical workflow. With the ease-of-use of surgical tools in mind, the scanner probe is designed for allowing a direct and safe placement on the tissue. In combination with the contrast agent fluorescein sodium*; tissue microstructure is visualized. **Instantly.**



Scanning the field of view with low-intensity laser light



Adjustable focus depth



Collecting fluorescence light

Image creation by confocal scanning microscopy:

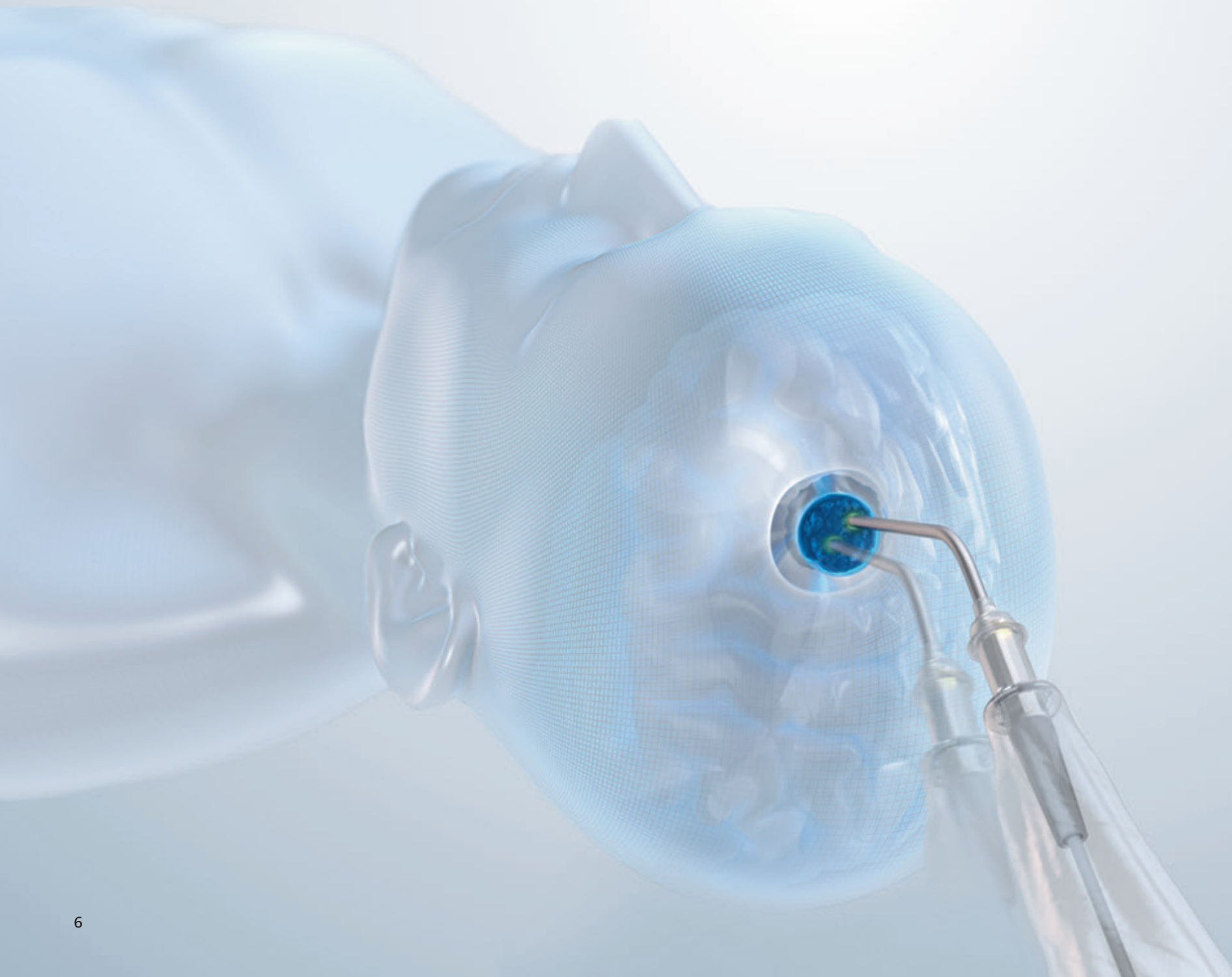
The scanner probe emits low-intensity laser light, which is focused at an adjustable focus depth inside the patient's tissue. The focal point is moved rapidly thereby scanning the field of view in quick repetition.

A fluorescent dye (usually fluorescein sodium*) present in the tissue is excited by the laser light at the respective focal point and consequently emits fluorescence signals. These signals are collected by the lens system inside the scanner probe and are used to reconstruct a histological image of the tissue microstructure.



Check a virtually unlimited number of samples in situ.

Visualization of tissue microstructure with CONVIVO from ZEISS requires no extraction or processing of tissue, allowing surgeons to take a virtually unlimited number of samples. The intuitive user interface allows for scanning of areas of interest, quickly capturing images from the desired locations. The neurosurgeon can review recorded images and select the most relevant ones for interpretation by pathologists. **Without a limit.**



Transfer and analyze digital images – anytime, anywhere.

Equipped with innovative ways to share data with pathologists, ZEISS CONVIVO is a unique and highly flexible endomicroscopy system. Review of in-vivo imaging data can be done by remote access allowing for immediate analysis of the recorded image. **Anytime, anywhere.**

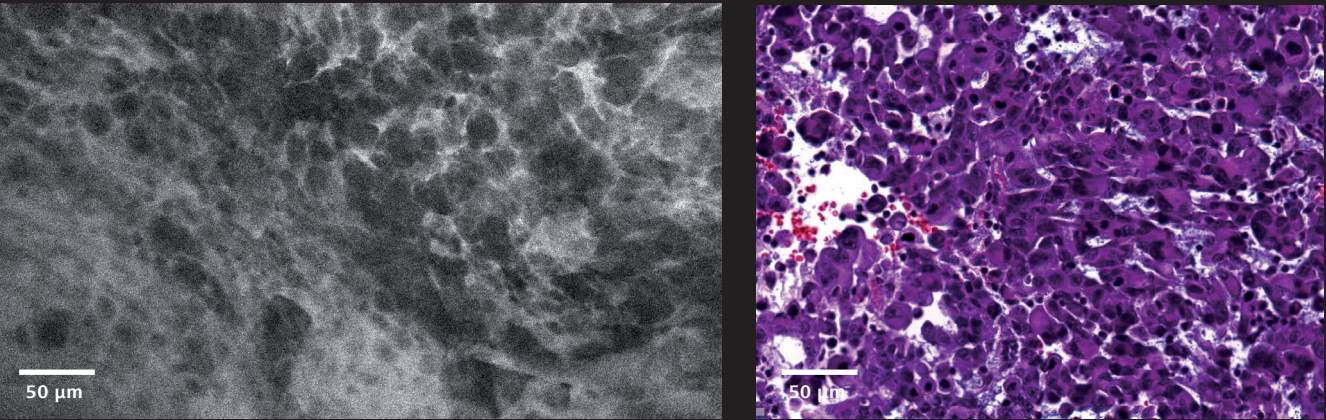


Recorded images can be transferred via the hospital network (shared network drive or PACS server), where they can be conveniently accessed by pathologists.

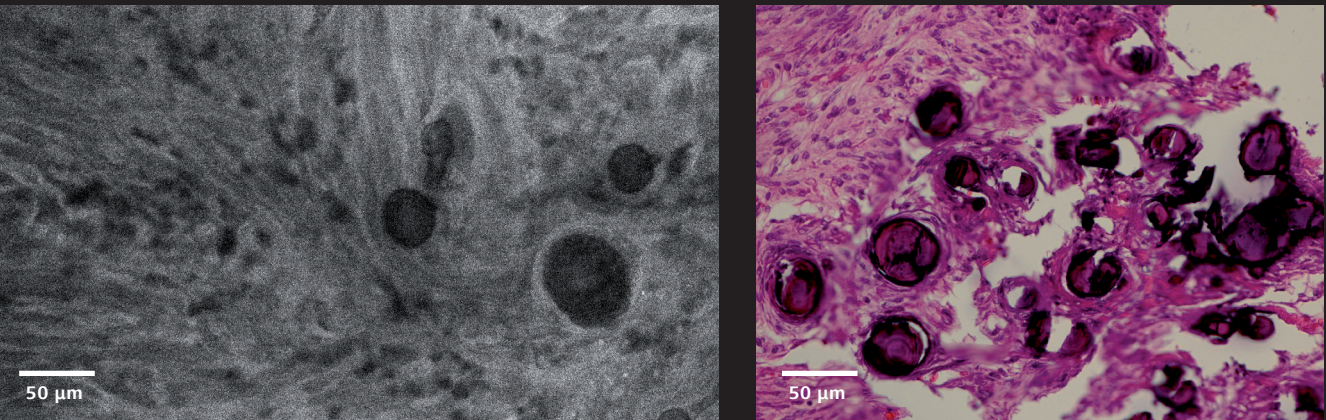
Image Gallery

Tissue microstructure

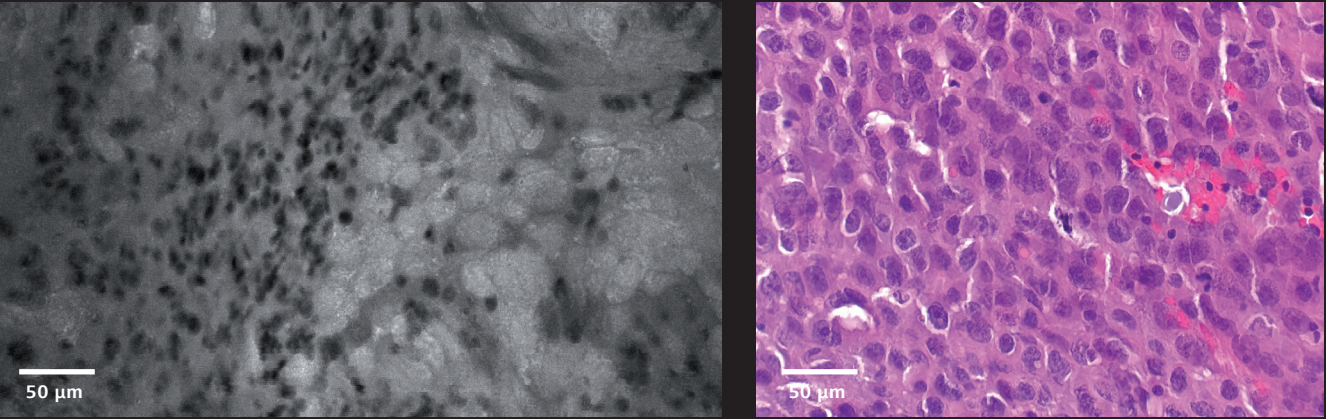
Comparison of matched ZEISS CONVIVO confocal images (left column) and traditional H&E-stained sections (right column) are shown below. Many features known from conventional histology can be reproduced with confocal endomicroscopy.



Experimental glioma in mice (in vivo) using intravenously injected fluorescein sodium.¹



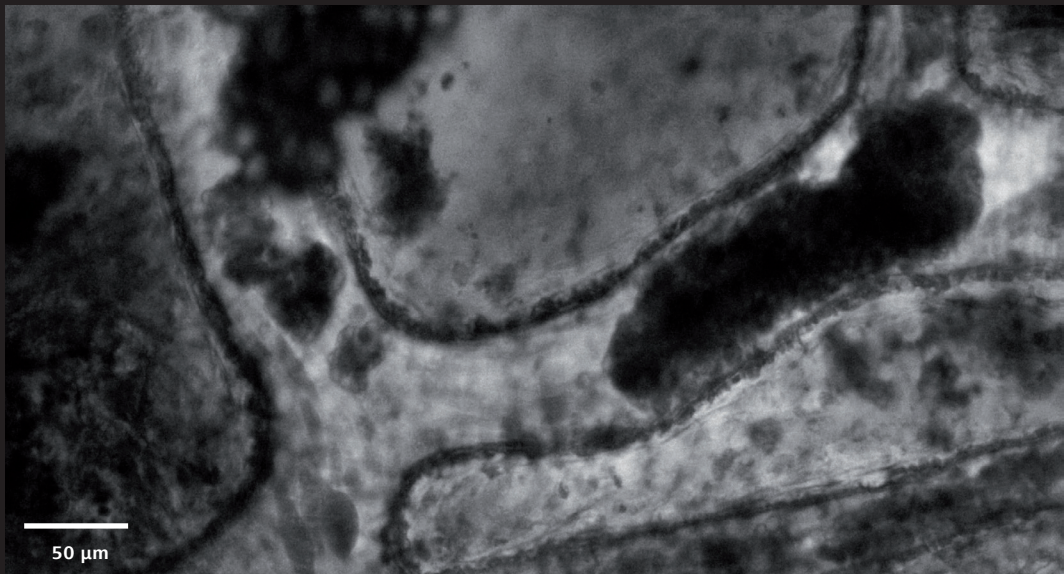
Human meningioma (ex vivo) using intravenously injected fluorescein sodium.¹



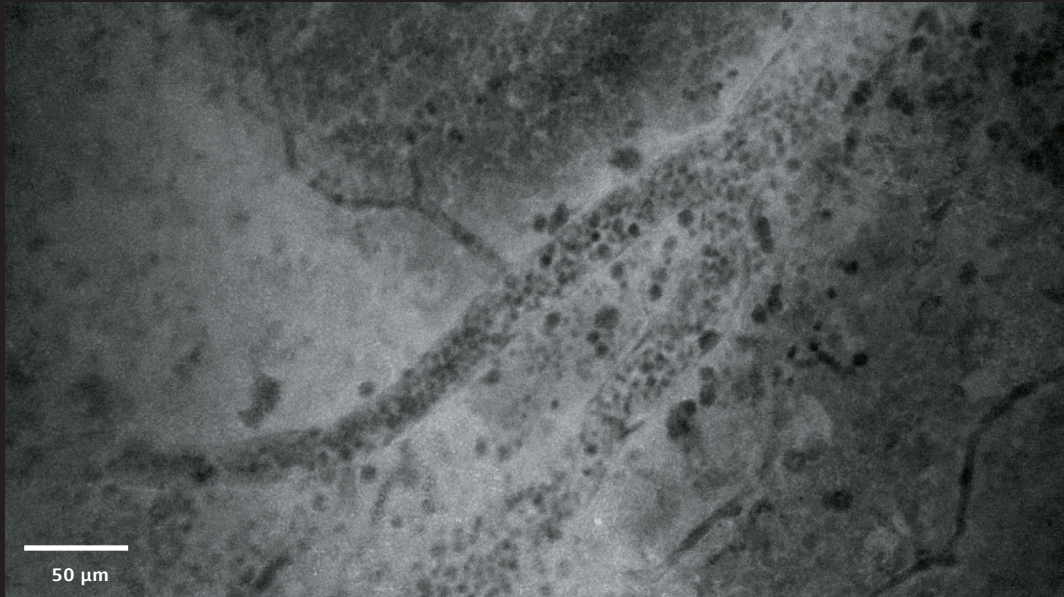
Human glioblastoma (ex vivo) using intravenously injected fluorescein sodium. Glomeruloid structures resulting from microvascular proliferation can be observed.²

Microvascular structures and blood flow

Images from animals show how microvascular structures can be visualized with ZEISS CONVIVO.

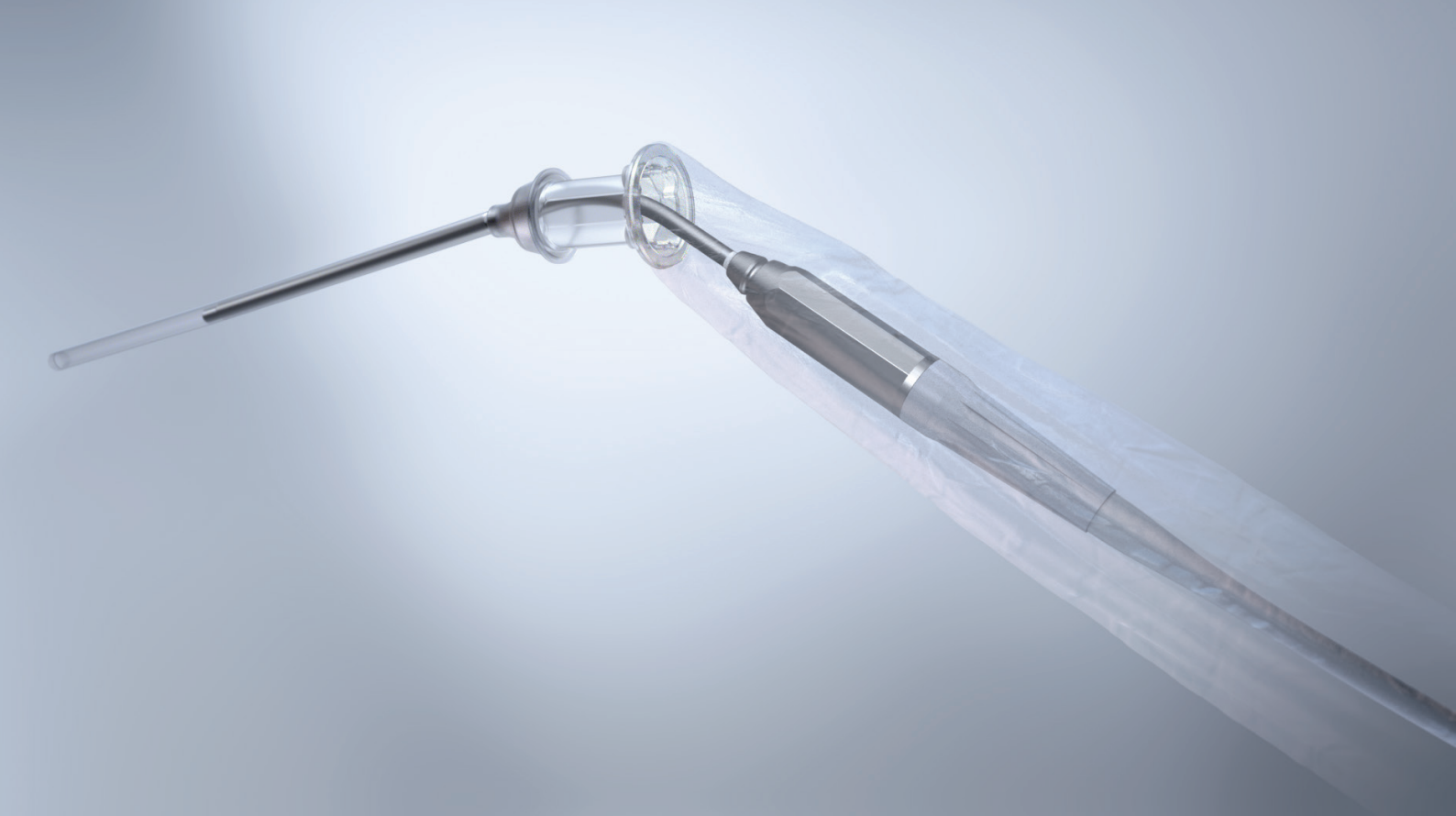


Experimentally induced thrombosis in pig brain (in vivo) using intravenously injected fluorescein sodium.¹



Experimental glioma in mice (in vivo) using intravenously injected fluorescein sodium. Flow of red blood cells in a blood vessel at the tumor periphery can be observed.¹

¹ Images courtesy of Dr. Mark C. Preul and Dr. Evgenii Belykh (Barrow Neurological Institute Neurosurgery Research Laboratory).
² Images courtesy of Prof. Dr. Jürgen Schlegel (Technical University of Munich).



Intuitive draping concept.

Quickly and effortlessly prepare the ZEISS CONVIVO probe with the ZEISS Sterile Sheath. Tailored specifically for the confocal endomicroscope, its ergonomic design makes sterile draping intuitive and handling easy. The premium quality of optics that you have come to expect from ZEISS is maintained in this consumable drape, ensuring optimal image results even at high magnification. **Sterile.**



Working seamlessly with ZEISS KINEVO 900.

ZEISS CONVIVO can directly interact with the Robotic Visualization System® KINEVO® 900 from ZEISS. Transferring video signals to ZEISS KINEVO 900 makes it possible to have views of tissue microstructure and the surgical views of the Robotic Visualization System on a single monitor. Combined triggering functionality on both systems makes recording as easy as pressing a button. **Workplace extended.**



Technical Data

CONVIVO from ZEISS

Technical Data	
Electrical Data	
Rated Voltage at 115V	100 V – 240 V
Rated Voltage at 230V	220 V – 240 V
Power Consumption at 115V	300 VA
Power Consumption at 230V	300 VA
Rated Frequency	50 Hz – 60 Hz
Electrical Standard	Complying with IEC 60601-1:2005+A1:2012 and IEC 60601-1-2:2014 Protection class I, degree of protection IP X0 (system cart), IP x6 (foot control panel)
Laser data	
Laser class	3R as per IEC60825-1:2014 and IEC 60825:2007
Laser power	1 mW
Wavelength	488 nm
Laser safety range	32 mm or more away from the tip of the scanner probe, time base 0.25 seconds
Recording parameters	
Field of view	Horizontal: approx. 475 µm Vertical: approx. 267 µm
Image resolution and frame rate	1920 x 1080 pixels (full HD) / 0.75 frames per second 1920 x 270 pixels / 2.35 frames per second
Emission Filters	Green band-pass filter (517.5 - 572.5 nm (545/55)) Green long-pass filter (> 515 nm) Red long-pass filter (> 572 nm) Neutral density filter (OD3, i.e. 0.1% transmission)
Dimensions and weights of system cart and monitor	
Dimensions (W x H x D)	750 x 1685 x 725 mm
Weight	165 kg
Weight of system incl. transport container:	approx. 335 kg



CONVIVO scanner unit from ZEISS

Technical Data	
Dimensions and weights of scanner probe	
Weight of scanner probe	1250 g
Length of scanner probe shaft	150 mm
Diameter of shaft with sterile sheath	5 mm
Length of cable	3.8 m
Sterile concept	
Sterile Drape	ZEISS Sterile Sheath for CONVIVO





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