

# Putting in vivo cellular imaging at your fingertips.



**ZEISS CONVIVO**

In Vivo Pathology Suite

[zeiss.com/convivo](https://zeiss.com/convivo)



Seeing beyond



## Neurosurgical challenge

Modern oncological neurosurgery is marked by a consensus that all surgical interventions should aim to attain complete tumor resection without affecting neurological function.

## Visualize tissue microstructure in real-time.

Connecting the Surgical Workplace to the Pathology Workplace, the In Vivo Pathology Suite CONVIVO® from ZEISS<sup>1</sup> can add real-time images of microstructures to the neurosurgical routine.

Thus, cross-functional medical team members – including pathologists – are enabled to remote-access in vivo images in the OR to provide digital image consultation.

The Surgical Workplace allows to seamlessly integrate imaging of cellular structures into the surgical workflow. Confocal laser scanning microscopy is used in combination with the contrast agent fluorescein sodium to visualize cellular and architectural characteristics of tissue with high resolution.

## Check a virtually unlimited number of samples\* in situ.

Imaging of cellular structures with CONVIVO from ZEISS requires no extraction or processing of tissue, thus allowing surgeons to take a virtually unlimited number of images. The intuitive user interface allows to scan tissue microstructure where needed, quickly delivering the necessary number of images. The surgeon can review recorded images and select the most relevant ones to share with cross-functional teams.

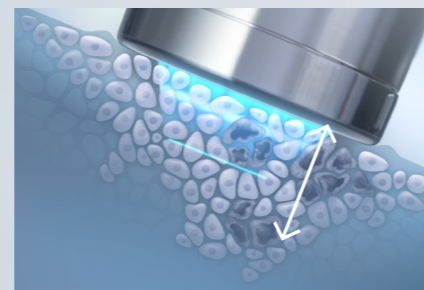
### Image creation by confocal scanning microscopy

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 fast, 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. Those signals are collected by the lens system inside the scanner probe and are used to reconstruct a digital image of the tissue microstructure.



Scanning the field of view with low-intensity laser light

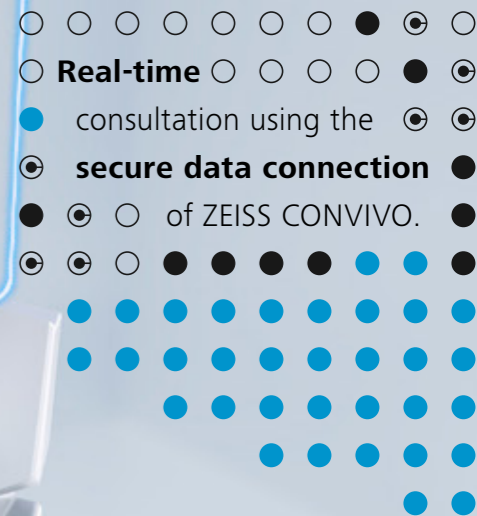
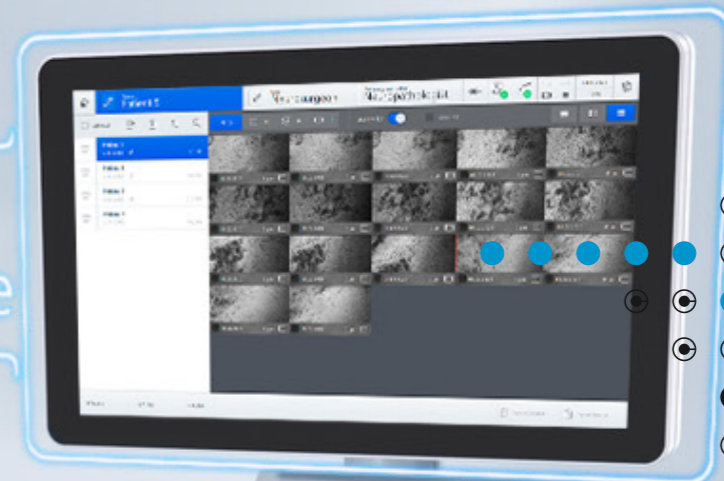


Adjustable focus depth



Collecting fluorescence light

Surgical Workplace



\* Samples in this context means digital images.

\*\* Please use the fluorescent agent as per the approval status for the application in your country.

## Transfer and analyze digital images – anytime anywhere.

With innovative ways to share data with cross-functional teams, ZEISS CONVIVO is a unique and highly flexible endomicroscopy system. Review of in-vivo imaging data can be done at the ZEISS Pathology Workplace by remote access allowing for immediate analysis of the image.



### Secure data transfer between Surgical and Pathology Workplace

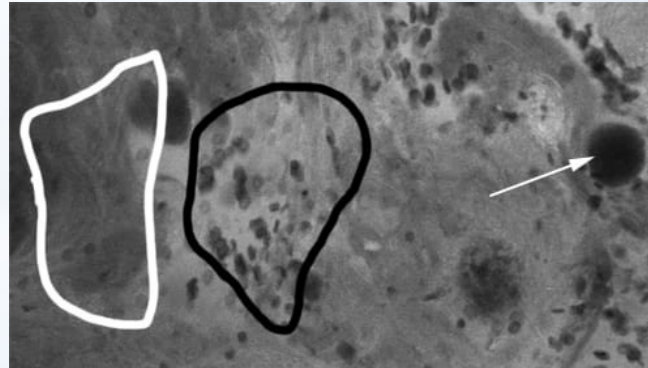
ZEISS CONVIVO is a cloud-based solution that involves a secure connectivity concept as an integral part. Real-time image transfer is protected by data encryption, network separation, and user authentication.

Developed with cybersecurity in mind, the In Vivo Pathology Suite meets the requirements of national data privacy and IT security in terms of confidentiality, availability, and integrity of clinical data.

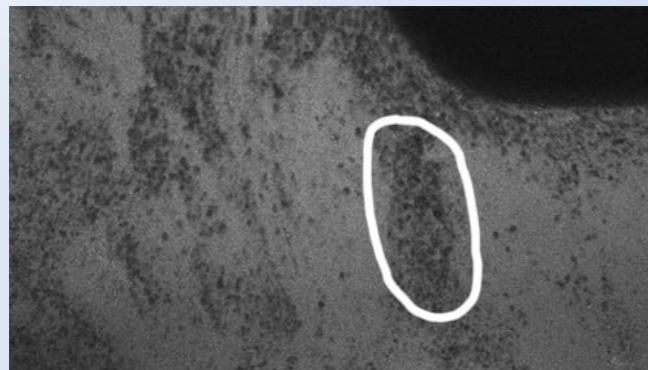
In setting up and maintaining secure operations, ZEISS collaborates closely with your IT department.

## Image gallery

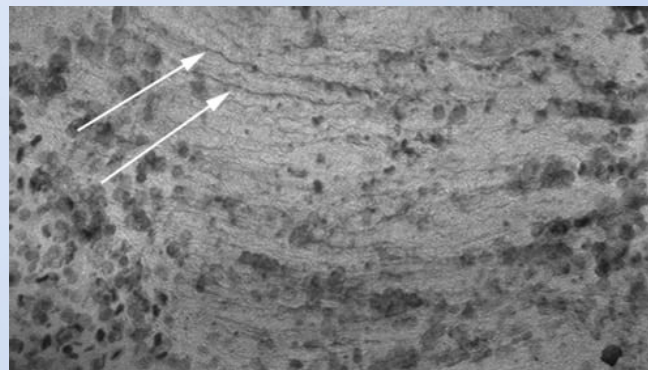
Selection of confocal images acquired from different patient cases. Arrows and circles indicate characteristics detected by pathologists, such as: Psammoma bodies, fibrous strings, monomorphic cell nuclei, and thin reticulin fibers. Many features known from conventional histology can be reproduced with confocal endomicroscopy.



*Tissue microstructure of a patient, diagnosed with a fibroblastic meningioma, WHO Grade I*



*Tissue microstructure of a patient, diagnosed with a recurrent glioblastoma, WHO Grade IV*



*Tissue microstructure of a patient, diagnosed with a schwannoma, WHO Grade I*



## ZEISS CONVIVO Community

For facilitating effective learning of confocal image reading, the ZEISS CONVIVO Community serves as a platform.

Moderated by experts, this community supports early clinical adopters during their individual learning curve with services such as: trainings in local reference sites, online peer-to-peer consultation, and online case discussion within the community.

## Intuitive draping concept

### ZEISS Sterile Sheath

ZEISS Sterile Sheath allows for quick and effortless preparation of ZEISS CONVIVO. Exclusively designed for ZEISS CONVIVO Surgical Workplace, draping is made intuitive, ensuring ergonomic and easy handling.

Premium optical quality, known from ZEISS, is maintained in the consumable drape, providing optimal image results even at high magnification.



## Speedy support and increased system availability

### ZEISS Smart Services

To efficiently deliver optimal surgical patient outcomes, availability of medical equipment – when needed – is key.

For maximum system availability and convenience, a comprehensive ZEISS OPTIME service package comes with ZEISS CONVIVO.

ZEISS OPTIME service agreements include secure connectivity for ZEISS Smart Services, allowing for immediate support by ZEISS Service Experts without them being on site.



## Technical data

### CONVIVO® from ZEISS

#### Electrical data

Rated voltage at 115 V	100 V - 240 V
Rated voltage at 230 V	220 V - 240 V
Power consumption at 115 V	300 VA
Power consumption at 230 V	300 VA
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 IEC 60825-1:2014 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 × 1080 pixels (full HD) / 0.75 frames per second 1920 × 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)

#### Connectivity / Data management

Live image data transfer	To the CONVIVO Pathology Workplace (through a ZEISS Site Control Unit)
DICOM module	For image data transfer. Patient management by modality worklist management.
Network access	WLAN and LAN

#### Dimensions and weights of system cart and monitor

Dimensions (w × h × d)	750 × 1685 × 725 mm
Weight	165 kg
Weight of system incl. transport container	approx. 335 kg

#### 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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Image courtesy of Technical University of Munich, Germany (Page 2, 6, 8)  
Images courtesy of University Regensburg Medical Center, Germany (Page 5)

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