IN-HOUSE IMAGING SERVICES

TAKE YOUR RESEARCH A STEP FURTHER

IN-HOUSE IMAGING SERVICE

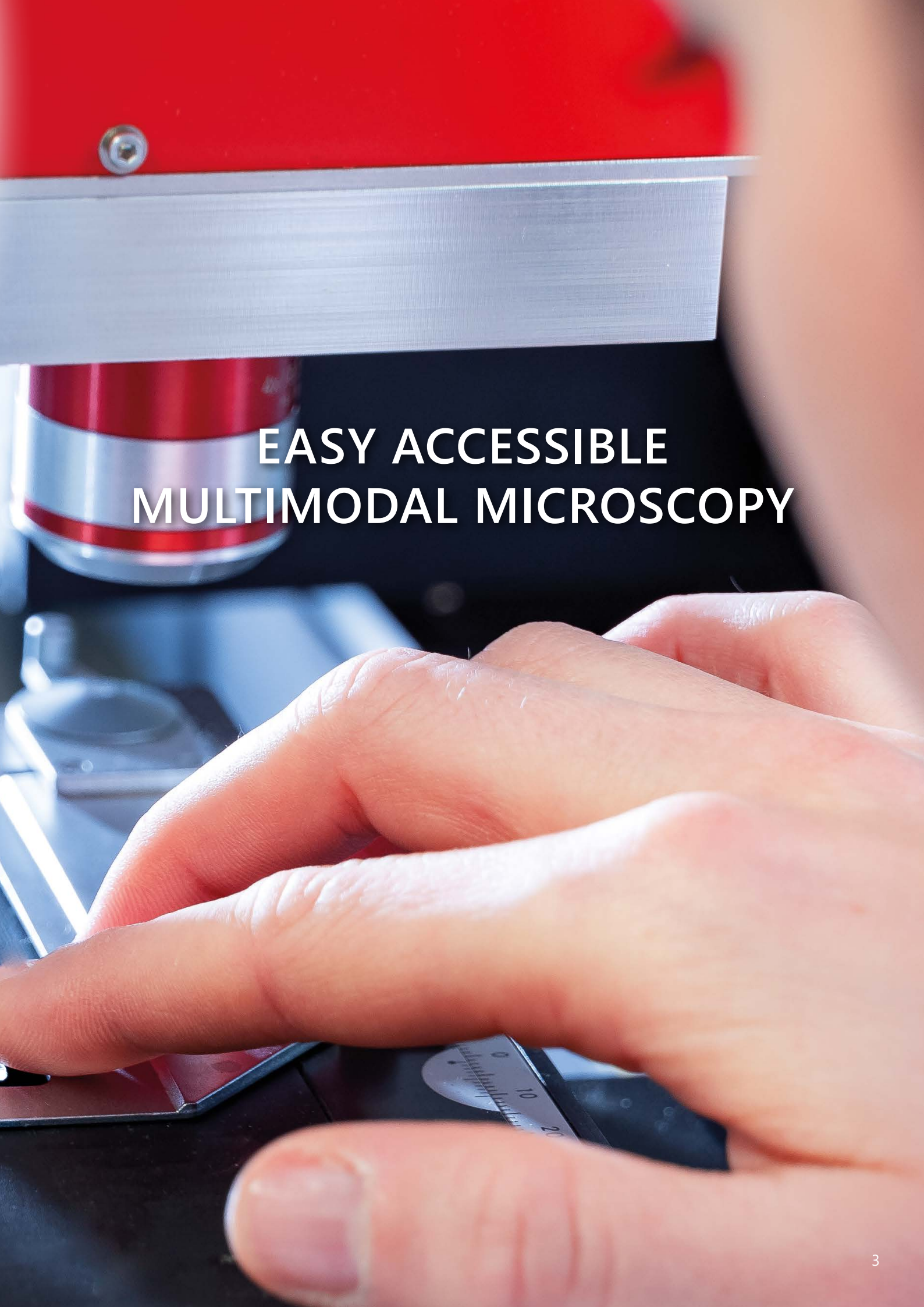
COME BY AND VISIT OR SEND US YOUR SAMPLES

There are two possibilities to book our in-house imaging service – come by, visit our facility and scan the samples together with our scientists, or send us the samples for characterization. On request our scientists will video chat with you through the working process. You can be assured our scientists will scan your samples according to your requirements and specifications.

To ensure the best quality for your research we offer free virtual demos with our scientists. In this demo our scientist will explain setups, demonstrate processes and assist you on setting the specifications, if necessary.

IMAGING SETUPS

- Widefield fluorescence
- Multi-photon fluorescence
- Whole slide imaging (WSI)
- Fluorescence Lifetime Imaging (FLIM)
- Light sheet – MesoSPIM V5
  (Part of the mesoSPIM community:
  https://mesospim.org)



EASY ACCESSIBLE MULTIMODAL MICROSCOPY

AVAILABLE SETUPS

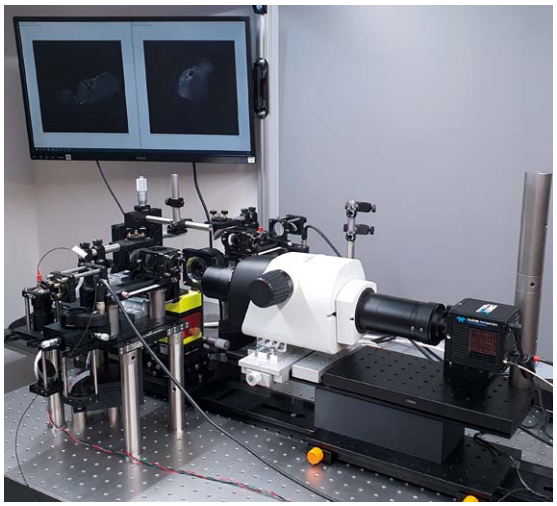
MATCH THE MICROSCOPE TO YOUR RESEARCH

WIDEFIELD FLUORESCENCE

- Upright and inverted configuration
- Illumination source: 8 discrete output bands through UV-NIR (380 – 750 nm),
- Variable filter sets
- sCMOS monochrome camera with >95% QE
- Color camera for brightfield imaging

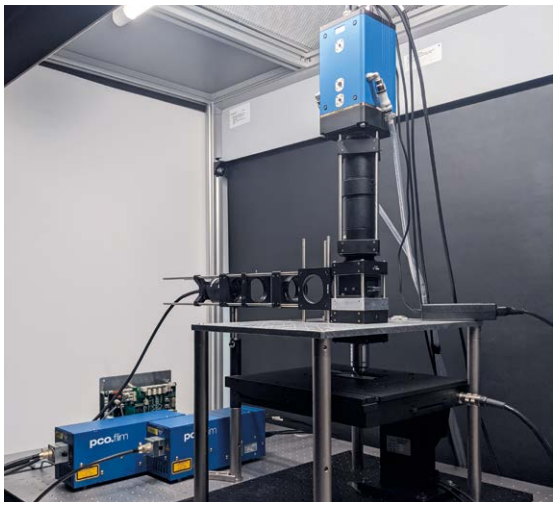
MULTI-PHOTON FLUORESCENCE

- Upright and inverted configuration
- Laser light sources used in MPX-series
- Tunable wavelengths 750 - 1300 nm
- Galvo-galvo scanning
- Up to 900 µm FOV
- Pixel up to 2048 x 2048



LIGHT SHEET – MesoSPIM V5

- Excitation laser with wavelengths: 405 nm, 488 nm, 638 nm
- Sample positioning with motorized XYZ - Stage
- Motorized zoom and focus module
- 2048 x 2048 pixels
- Part of the mesoSPIM community: **https://mesospim.org**



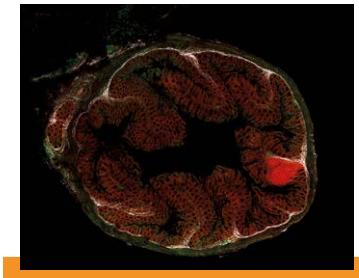
FLUORESCENCE LIFETIME IMAGING (FLIM)

- Frequency Domain FLIM with modulatable CMOS imaging sensor
- Operable frequency range of **5 kHz - 40 MHz** (pco.flim), lifetime resolution of 100 ps
- Excitation laser with wavelengths: 405 nm (120 mW), 445 nm (100 mW)
- Integrated in Nikon NIS Elements AR software
- TD-FLIM setup available on request

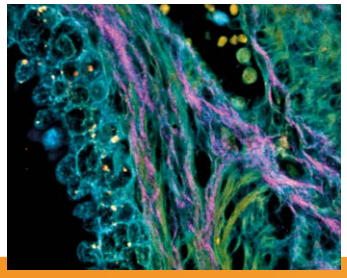
HIGH FLEXIBILITY

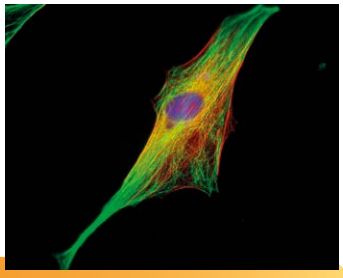
ALMOST NO LIMITS IN APPLICATIONS

SWITCHING IMAGING LEVELS WITH A FEW CLICKS



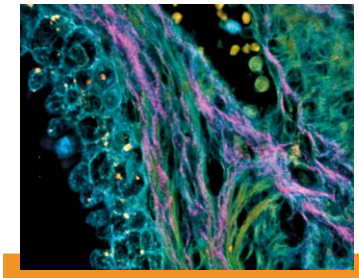
Whole Slide Imaging (WSI)



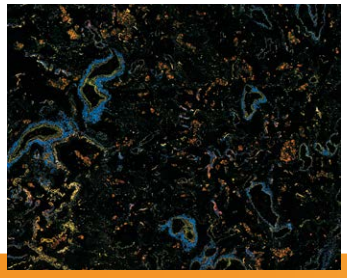


Single Cell Imaging

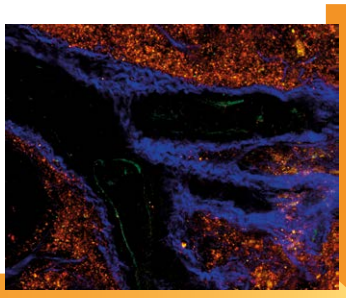
BROAD VARIETY OF SAMPLES



FFPE Samples

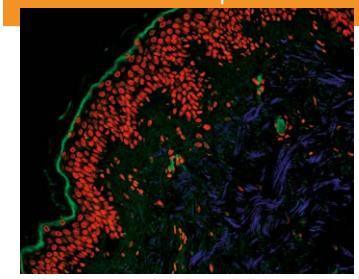


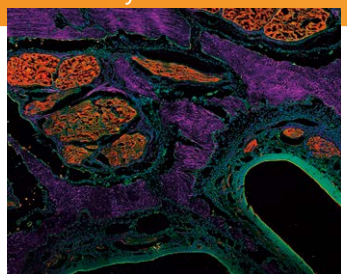
Cryosections

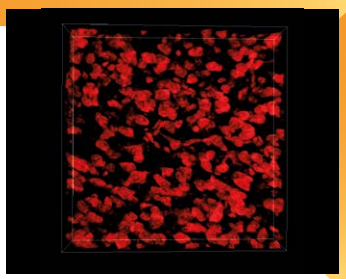


3D Tissue

Label-free







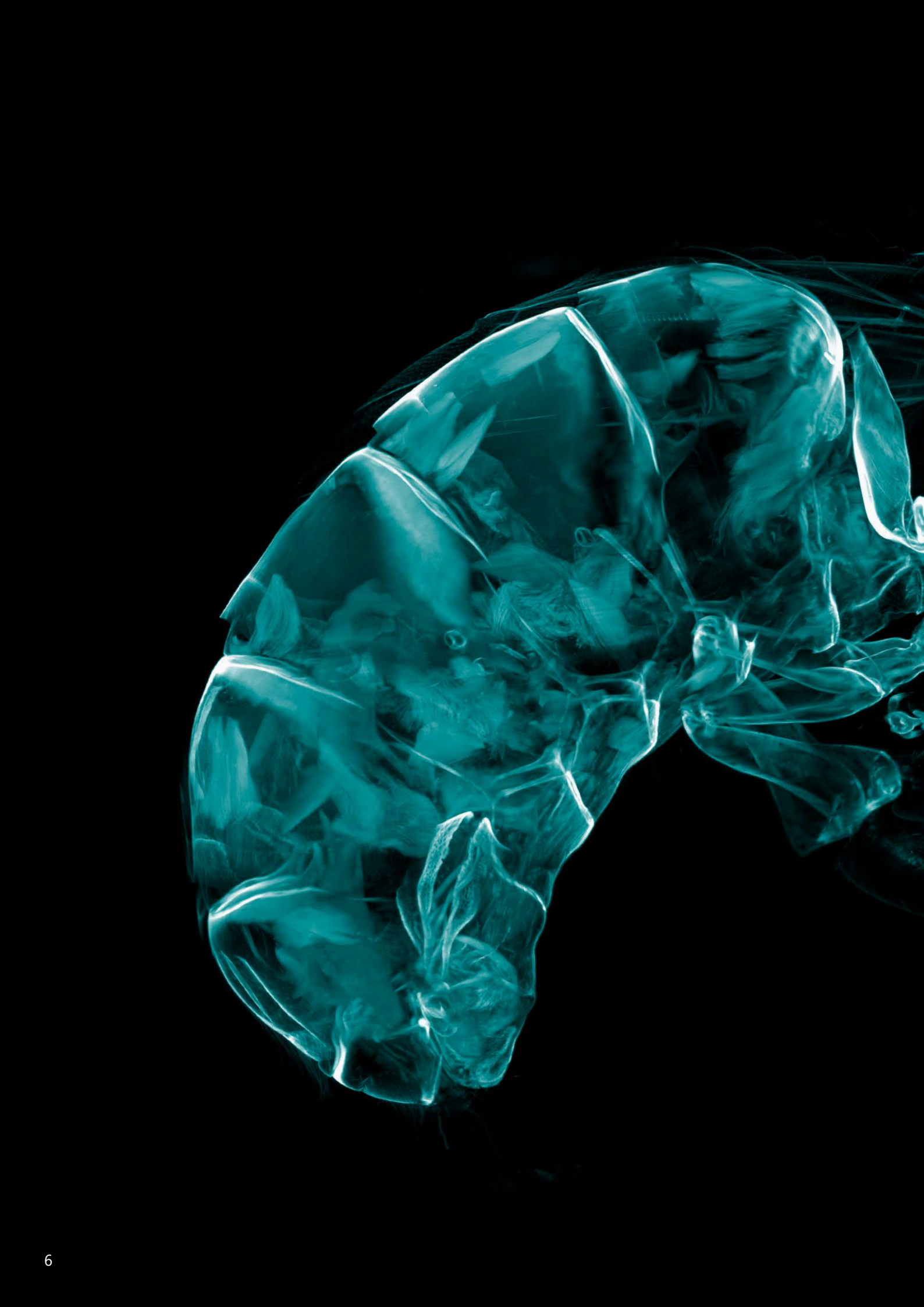
IHC/ICC

FLEXIBLE WORKING DISTANCE

Live Animal Imaging

3D cell culture /whole organs

Sections



SUCCESS STORIES

WIDEFIELD FLUORESCENCE– IHC-stained mouse head sagittal plane

WIDEFIELD SETUP

REVOLUTIONIZING NOSE TO BRAIN DRUG DELIVERY

In co-operation with the University of applied sciences Biberach our scientists have been acquiring images for the Nose-to-Brain (N2B) patch project (www.n2b-patch.eu).

In November the paper based on the research of the N2B-patch project was published:
Selective CNS Targeting and Distribution with a Refined Region-Specific Intranasal Delivery Technique via the Olfactory Mucosa
Frank Maigler, Simone Ladel, Johannes Flamm, Stella Gänger et al., Pharmaceutics, 2021

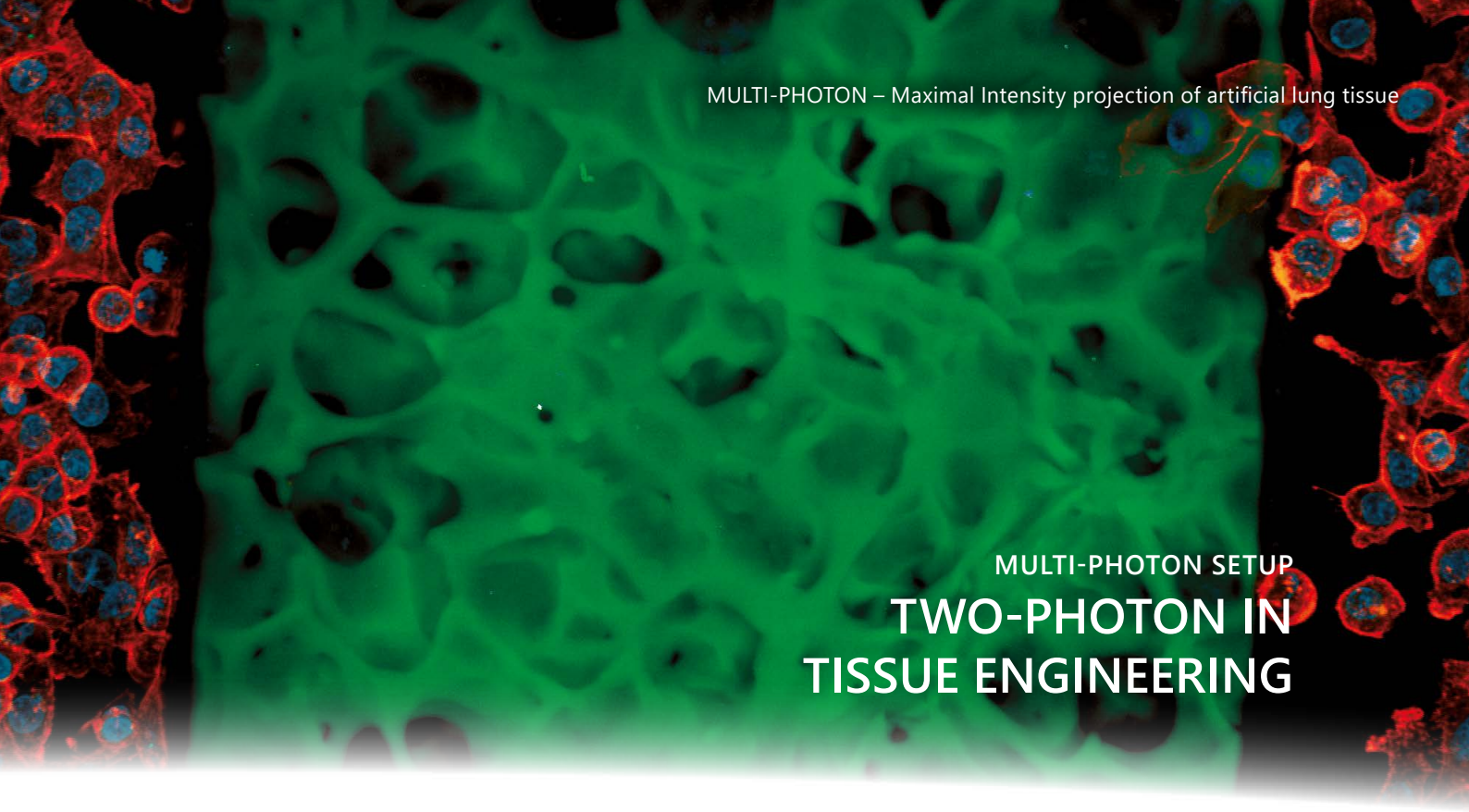
DETAILS:

- **Partner:** University of applied sciences Biberach, Biberach (Germany)
- **System:** MPX-1040 widefield, 4x Objective, FOV 2.5 x 1.3 cm
- **Sample:** mouse head cryosection sagittal – cell nuclei (blue), NF200 (green), mouse IgG (red)

PARTNER CONTACT:
Prof. Dr. Katharina Zimmermann-Schindowski
Hochschule Biberach, Biberach
Email: zimmermann@hochschule-bc.de

N2B-PATCH PROJECT

This ground breaking project developed a proof of concept for an intranasal nose-to-brain (N2B) drug delivery of therapeutic antibodies for multiple sclerosis (MS) treatment. Because the antibodies will be applied on the direct transport route from the nasal cavity to the brain they can bypass the blood-brain barrier which would mean a big advantage compared to the current routes of application.



MULTI-PHOTON – Maximal Intensity projection of artificial lung tissue

MULTI-PHOTON SETUP

TWO-PHOTON IN TISSUE ENGINEERING

The field of tissue engineering focuses on tissue regeneration and aims to find approaches to replace injured or pathogenic tissue with ex vivo engineered substitutes.

This amazing artificial lung tissue was engineered by Amelie Erben, supervised by Dr. Stefanie Sudhop at the Center for Tissue Engineering and Regenerative Medicine (CANTER) at the University of applied sciences Munich.

As a template for this nanoscribe 3D-printed tissue-scaffold, native lung tissue was decellularized and used as CAD- model for 3D printing.

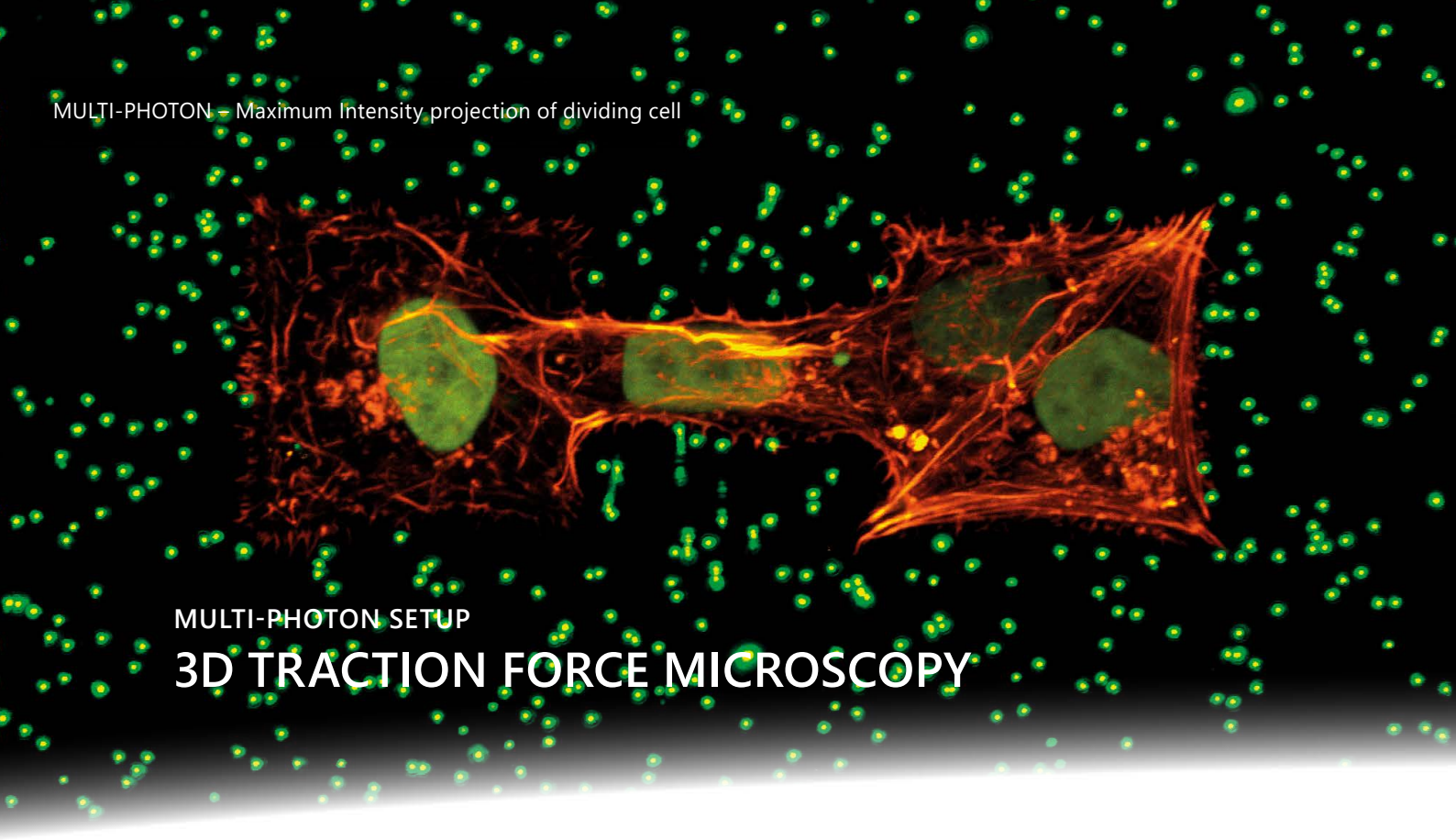
DETAILS:

- **Partner:** CANTER lab, Munich (Germany)
- **System:** MPX-1040 multi-photon, 20x Objective, FOV 600 µm
- **Sample:** 3D nano-printed GM10 with Rose Bengal scaffold (green) seeded with A549 cells – cell nuclei (blue), actin (red)

PARTNER CONTACT:
Dr. Stefanie Sudhop
CANTER lab, Munich
Email: stefanie.sudhop@hm.edu

Multi-photon imaging with the MPX-1040 allows us to image our 3D Tissue-engineered constructs. Here, we could image a cell-seeded nanoscribe 3D-printed lung tissue scaffold of 300 µm x 300 µm x 300 µm. The high penetration depth combined with the intrinsic confocal features of Multi-Photon microscopy makes it a suitable tool for us to image our samples.

Amelie Erben



MULTI-PHOTON – Maximum Intensity projection of dividing cell

MULTI-PHOTON SETUP

3D TRACTION FORCE MICROSCOPY

Traction Force Microscopy senses the small forces cells exert on their environment but often is limited to 2D analyses. with these in-house named „dumbbells" Prof. Joachim Rädler and his team of the Ludwig-Maximilan's University of Munich (LMU) paves new approaches for 3D traction force microscopy. In this technique, hydrogels with a defined rigidity are loaded with fluorescent beads. Forces generated by cells migrating through microstructures within these geles can now be determined by the movement of the beads.

A brilliant move towards mechanobiology!

DETAILS:

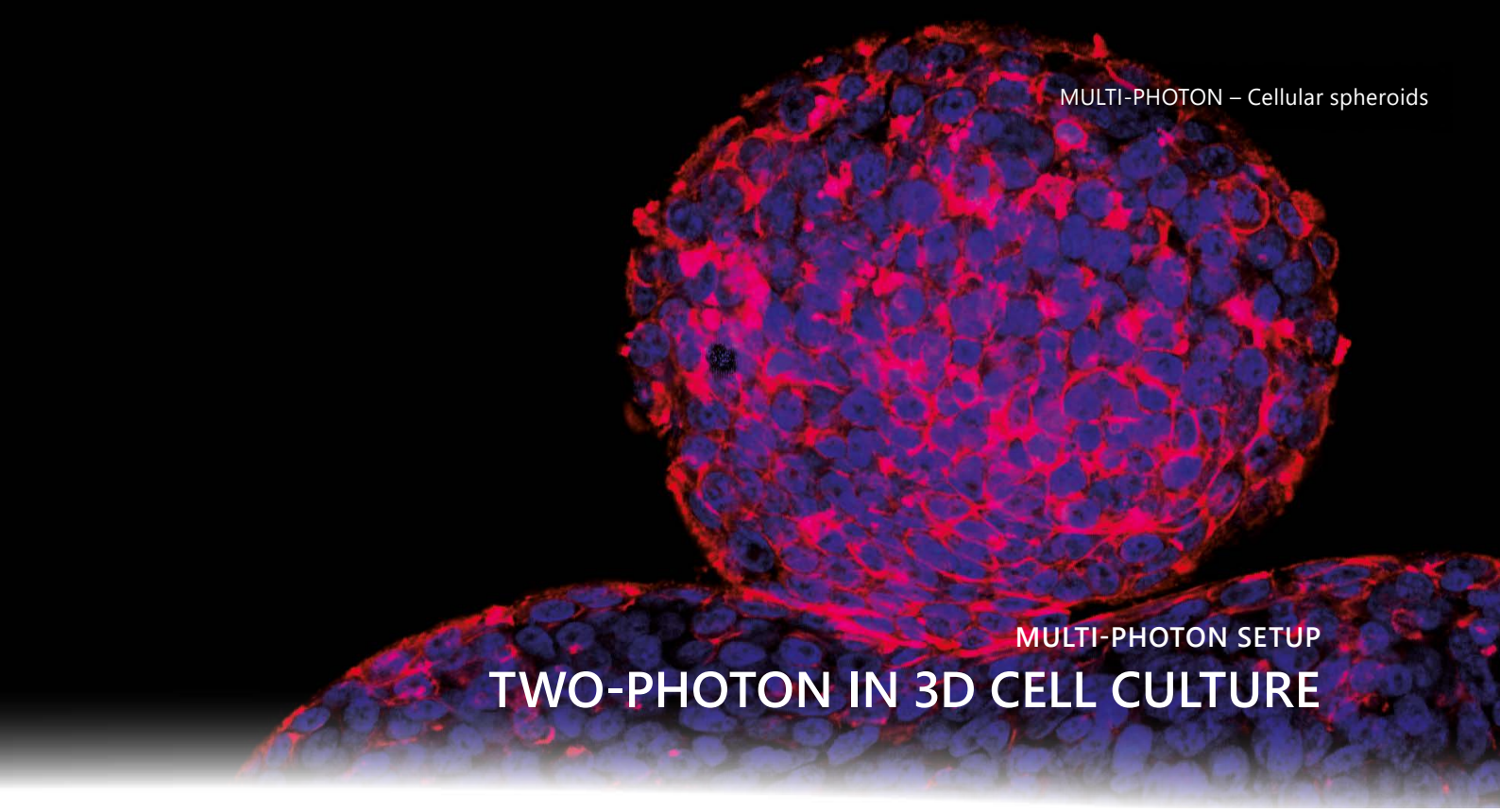
- **Partner:** Partner: LMU - soft condensed matter group, Munich (Germany)
- **Setup:** MPX-1040 multi-photon, 60x Objective, FOV 200 µm
- **Sample:** 3D hydrogel with fluorescent beads (green) seeded with stable H2B-mCherry expressing cells (yellow) and actin (red)

PARTNER CONTACT:

Stefan Stöberl – LMU, Munich
Email: stefan.stoeberl@physik.uni-muenchen.de

With 3D cell culture experiments comes the challenge of 3D imaging. The MPX 1040 system enables us to visualize the cells in a 3D hydrogel. The MPX enables z-stack imaging with high resolution which is a requirement for the analysis of this traction force technique.

Stefan Stöberl, PhD student



MULTI-PHOTON SETUP

TWO-PHOTON IN 3D CELL CULTURE

3D cell culture systems namely spheroids and organoids are used to better recapitulate in vivo cellular biology. Studying 3D cell cultures gives many insights about cell-cell contact as well as in vivo cellular microenvironment which plays an important role in e.g. drug development and cancer treatment.

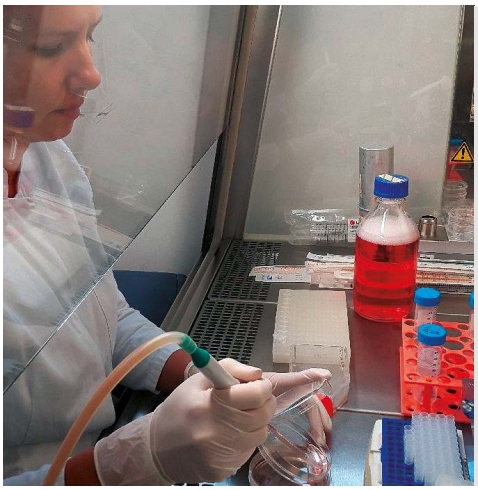
In cooperation with the Vorarlberg Institute for Vascular Investigation and Treatment (VIVIT) Dr. Christine Heinzle cultivated this amazing spheroids, originating from human colon cancer cells (DLD1).

DETAILS:

- **Partner:** VIVIT, Dornbirn (Austria)
- **System:** MPX-1040 multi-photon, 20x Objective, FOV 600 µm
- **Sample:** HCT-116 spheroids – cell nuclei (blue), actin (red)

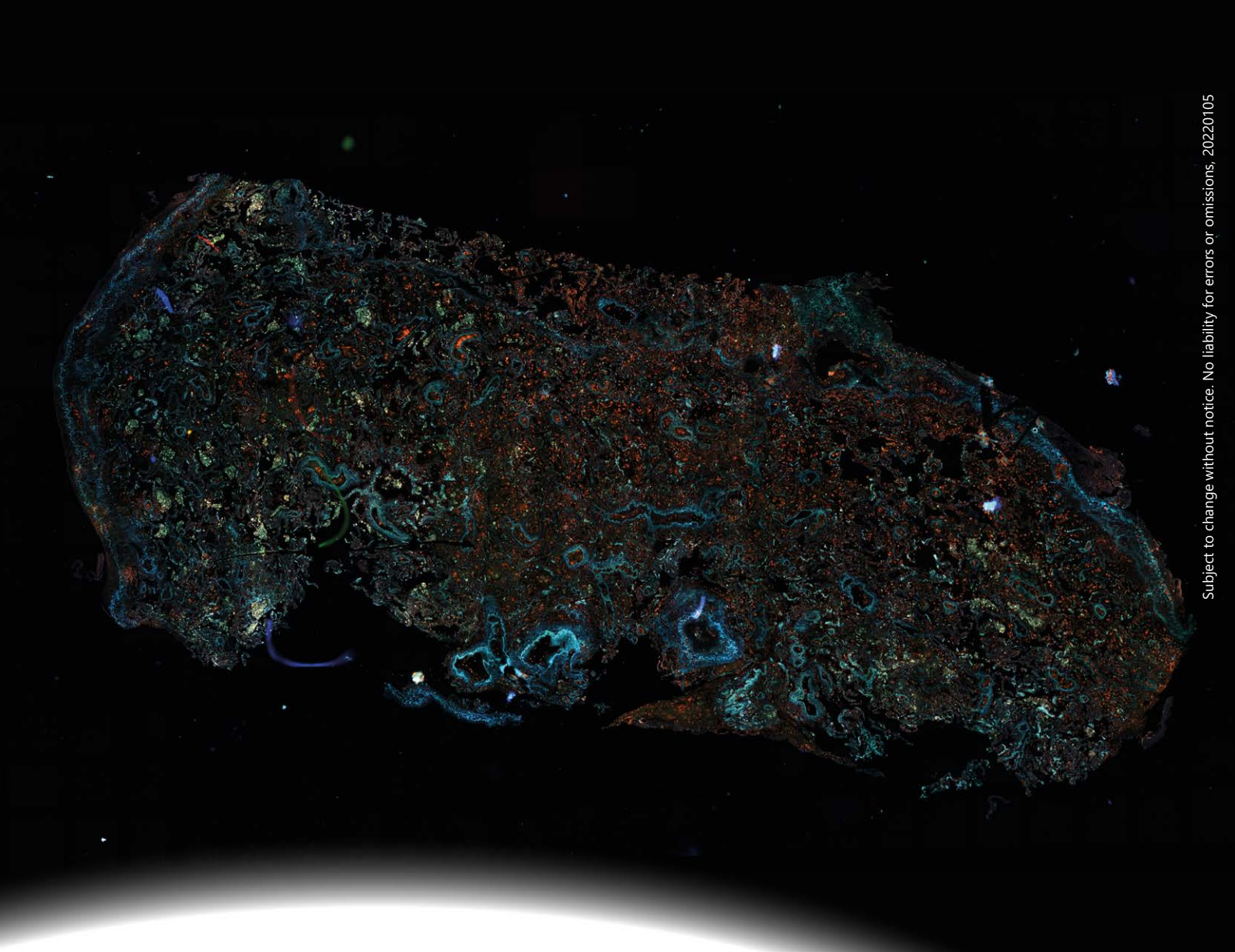
PARTNER CONTACT:

Dr. Christine Heinzle
VIVIT, Dornbirn
Email: christine.heinzle@vivit.at



Using the MPX-1040 multi-photon setup we could easily image spheroids up to 200 µm without clearing methods. Sample transfer was very straightforward and correspondence with the team of PI highly satisfactory.

Dr. Christine Heinzle, VIVIT



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