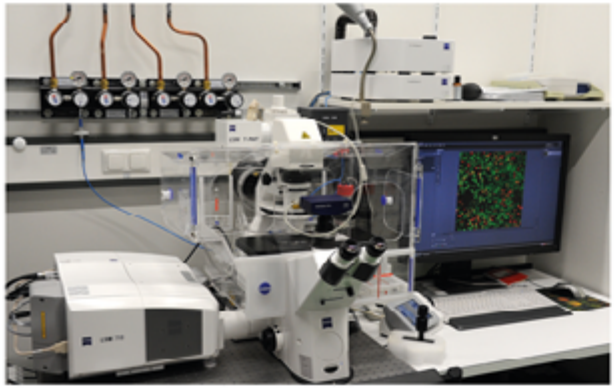
Equipment

- Zeiss LSM 710 confocal laser scanning microscope (inverted)
  - Laser lines 405, 458, 488, 514, 561 and 633 nm
  - Spectral detection unit
  - Motorized stage
  - Incubator for live-cell imaging
- Nikon A1 Ti2 N-STORM confocal laser scanning microscope (inverted)
  - Laser lines 405, 445, 488, 514, 561 and 647 nm
  - Spectral detection unit
  - Motorized stage
  - N-STORM unit for single molecule localization super-resolution microscopy (SMLM)
- All microscopes are located in an air conditioned darkroom



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IZKF Interdisziplinäres Zentrum für Klinische Forschung | RWTH AACHEN UNIVERSITY

Core Facilities – Technologies, equipment and expertise for ambitious research goals

The IZKF provides valuable resources for a cost effective and high-quality research environment by operating:

- Brain Imaging Facility
- Genomics Facility
- Immunohistochemistry Facility and Confocal Microscopy Facility
- Proteomics Facility
- Transgenic Service
- Two-Photon Imaging Facility
- Flow Cytometry Facility

Multiple technologies and state-of-the-art equipment are available for all researchers of the Faculty of Medicine. Experienced technology experts provide services at any stage of the research process, including experimental design, method development, sample work-up and data interpretation on a partly cost recovery basis.

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Thinking the Future
Zukunft denken

Confocal Microscopy Facility

Confocal Images in 2D and 3D

Live-Cell Imaging

Advanced Fluorescence Techniques (FRAP, FLIP, FRET, dSTORM, PALM)

Consulting and Application Training

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Confocal Microscopy Facility
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Why use Confocal Microscopy and how to use it to your advantage?

Confocal microscopy generates sharp images from fluorescently labelled samples. Out-of-focus light that blurs the image in conventional microscopy cannot pass the confocal pinhole and is therefore eliminated. From serial optical sections a 3-dimensional representation of a sample can be generated. Confocal microscopy is performed on tissue sections, fixed cultured cells or even with living cells containing an appropriate fluorescence label. Laser light is used for efficient excitation of fluorescently labelled samples. The various lasers of a confocal microscope can also be used as a precision tool to modulate fluorescence in living cells with subcellular resolution. Based on this property, advanced fluorescence techniques have emerged that can give access to the intracellular dynamics and interactions of fluorescently labelled biomolecules.

What services do we offer?

Confocal Microscopy can be used for the generation of confocal images of fixed samples and the investigation of living cells with advanced fluorescence techniques.

Confocal images:

- Pre-experimental consulting and hands-on training
- 2-dimensional confocal images
  - Multi-channel images with up to 4 fluorophores
  - Exact overlay with differential interference contrast (DIC) images
  - Fluorescence intensity profiles
  - Colocalization analysis
- 3-dimensional confocal images
  - Preparation of image stacks („z-stacks")
  - Reconstruction of 3-dimensional objects

Advanced fluorescence techniques:

- Pre-experimental consulting and hands-on training
- FRAP (fluorescence recovery after photobleaching) and FLIP (fluorescence loss in photobleaching) to determine the mobility of fluorescently labelled molecules in living cells
- FRET (Förster resonance energy transfer) to detect interaction of fluorescently labeled molecules
- Use of photoconvertible and photoactivatable fluorescent proteins to determine protein dynamics in living cells
- Super-resolution microscopy based on single molecule localization such as dSTORM and PALM
- Live-cell imaging with temperature- and CO_2-control