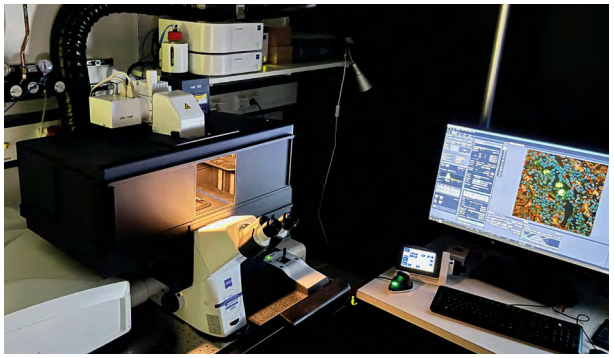
- Zeiss LSM 710 confocal laser scanning microscope (inverted)
  - Laser lines 405, 458, 488, 514, 561 and 633 nm
  - Spectral detection unit
  - Motorized stage
  - Incubator for live-cell imaging

- All microscopes are located in an air-conditioned darkroom



Zeiss LSM 980 with Airyscan 2

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

The Interdisciplinary Center for Clinical Research (IZKF) provides valuable resources for a cost-effective, high-quality research environment.

A wide range of technologies and state-of-the-art equipment are available for all RWTH Aachen University researchers. Experienced technology experts provide services at every stage of the research process, including experimental design, method development, sample work-up, and data interpretation, on a partial cost recovery basis.

BIF Brain Imaging Facility
PF Proteomics Facility
CMF Confocal Microscopy Facility
FCF Flow Cytometry Facility
TF Transgenic Facility
2PIF Two-Photon Imaging Facility
IHF Immuno-histochemistry Facility
GF Genomics Facility

3D SRF Super Resolution Facility

Karen De Bruyne, M.A.
IZKF Scientific Coordinating Office
Pauwelsstraße 30 I D-52074 Aachen
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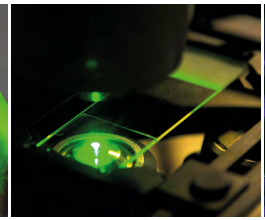
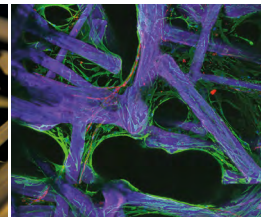
Thinking the Future
Zukunft denken

CMF Confocal Microscopy Facility IZKF

Confocal Images in 2D and 3D

Live-cell imaging

Advanced fluorescence techniques

Advice and hands-on training

Prof. Dr. Gerhard Müller-Newen
Confocal Microscopy Facility
Office: elevator D2 I 6th floor I corridor D I room 11
Microscope: elevator D2 I 3rd floor I corridor 42 I room 13
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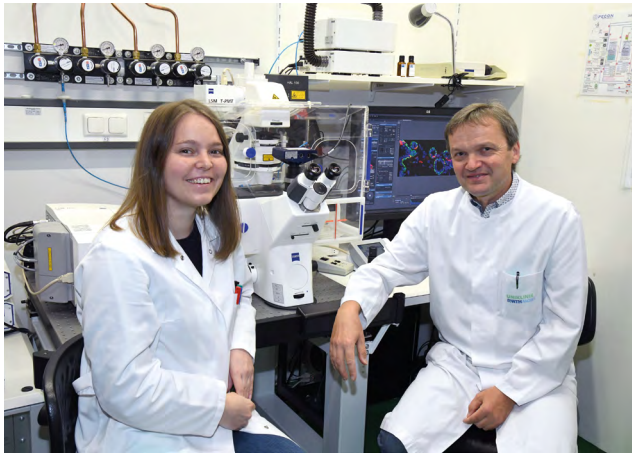
IZKF Interdisziplinäres Zentrum für Klinische Forschung | RWTH AACHEN UNIVERSITY

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, which 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 living cells that contain an appropriate fluorescence label. Laser light is used to efficiently excite fluorescently labeled 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.



Team of the Confocal Microscopy Facility

What services do we offer?

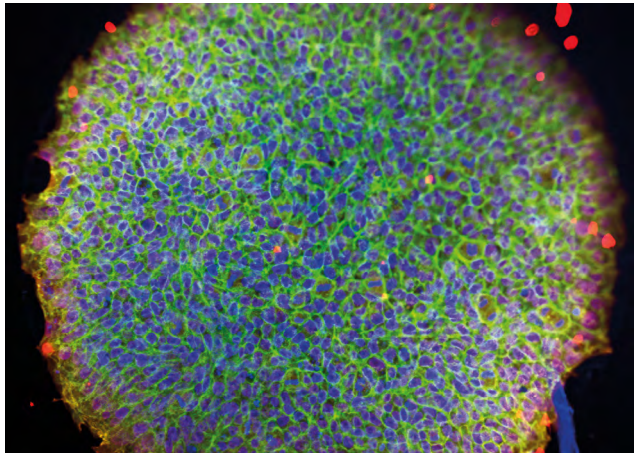
Confocal Microscopy can be used to produce confocal images of fixed samples and to examine living cells using advanced fluorescence techniques.

Confocal images:

- Pre-experimental advice and hands-on training
- 2-dimensional confocal images
  - Multi-channel images with up to 4 fluorophores
  - Accurat 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 advice 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
- Spectral imaging and linear unmixing for the separation of more than 4 fluorophores
- Single-molecule RNA fluorescence in situ hybridization (smRNA-FISH)
- High-resolution microscopy based on the Zeiss Airyscan 2 detector
- Live-cell imaging with temperature- and CO_2-control



BMSC-derived iPSC colony. Image by M. Mabrouk

Equipment

- Zeiss LSM 980 with Airyscan 2 confocal laser scanning microscope (inverted)
  - Laser lines 405, 488, 561 and 639 nm
  - Multiplex-mode for fast scanning
  - Motorized stage
  - High-resolution imaging with Airyscan 2 detector
  - Incubator for live-cell imaging