Julius-Maximilians-
UNIVERSITÄT WÜRZBURG

CoreUnit Imaging

RUDOLF VIRCHOW CENTER

Core Unit Fluorescence Imaging

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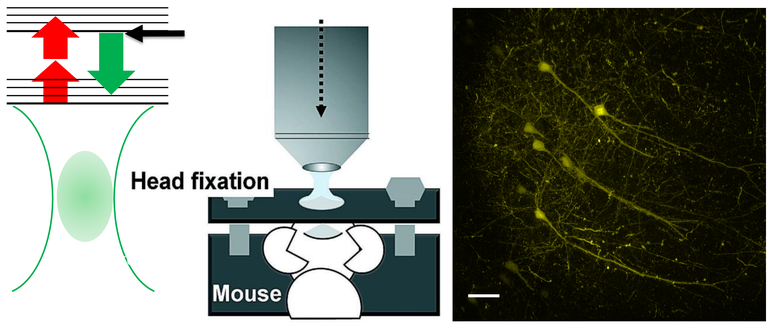
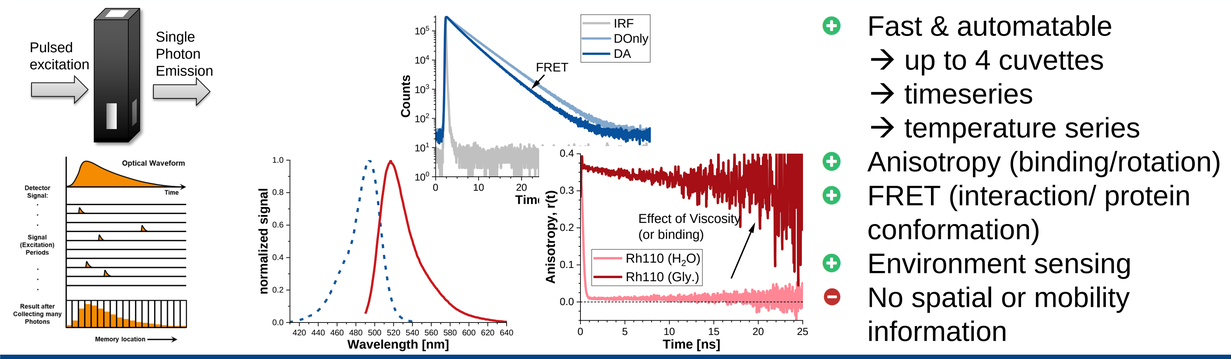
Two-Photon Microscopy (2PM)



- ⊕ Optical sectioning
- ⊕ 3D imaging
- ⊕ Deep tissue penetration
- ⊕ Intravital imaging
- ⊕ Low autofluorescence

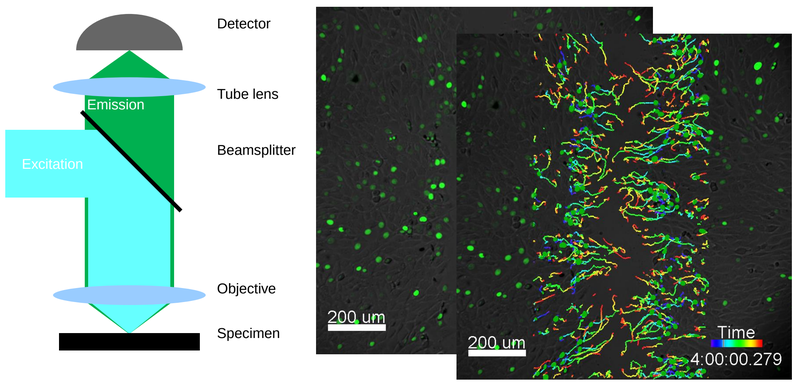
- ⊖ Slow
- ⊖ Limited choice of dyes
- ⊖ High risk of photobleaching

Fluorescence (Lifetime) Spectrometer



- ⊕ Fast & automatable
  - → up to 4 cuvettes
  - → timeseries
  - → temperature series
- ⊕ Anisotropy (binding/rotation)
- ⊕ FRET (interaction/ protein conformation)
- ⊕ Environment sensing
- ⊖ No spatial or mobility information

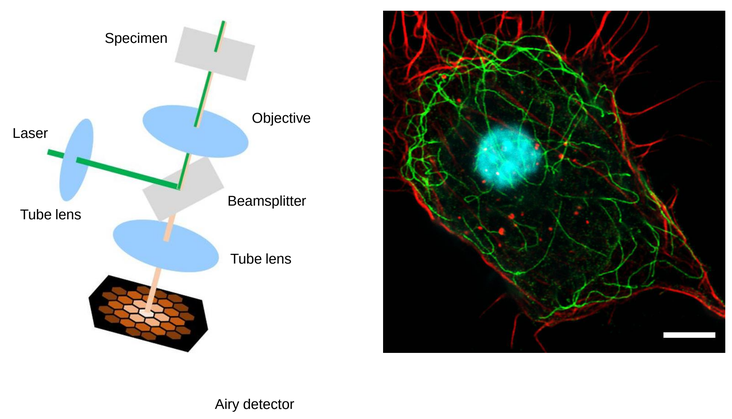
Fluorescence Video Microscopy



- ⊕ Fast (camera-based acquisition)
- ⊕ Multi-color
- ⊕ Live cell long-term acquisition
- ⊕ Photon efficient

- ⊖ No optical sectioning
  - → risk to detect scattered and out-of focus light

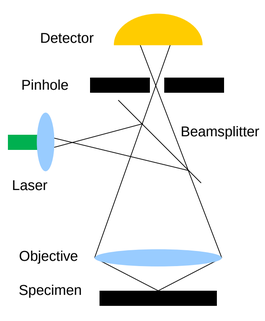
AiryScan Super-resolution Microscopy (LSM980)

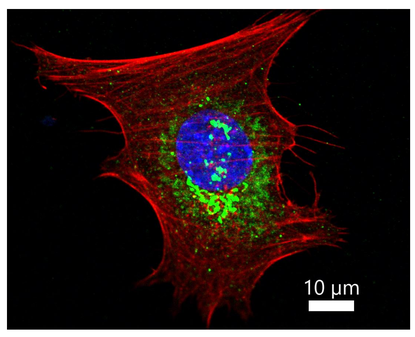


- ⊕ 3D imaging & Optical sectioning (airy disc elements)
- ⊕ Up to 1.8x resolution enhancement
- ⊕ Live cell long-term acquisition
- ⊕ Multicolor

- ⊖ Risk of photobleaching
- ⊖ Low sample penetration
- ⊖ Slow

Confocal Fluorescence Microscopy

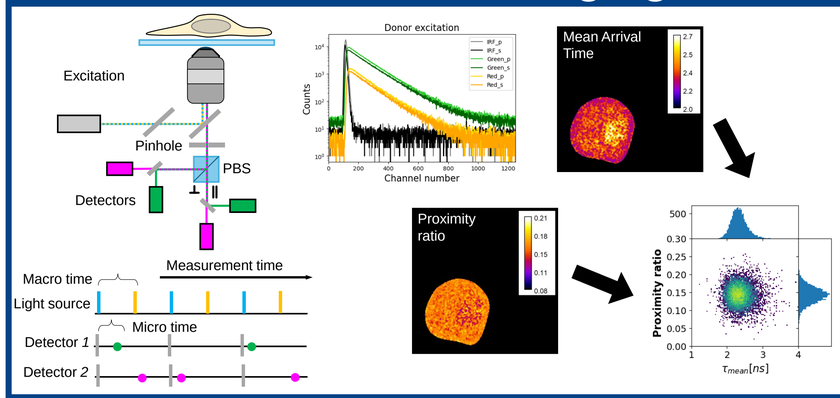




- ⊕ Optical sectioning (pinhole)
- ⊕ 3D imaging
- ⊕ Live cell long-term acquisition
- ⊕ Multi-color

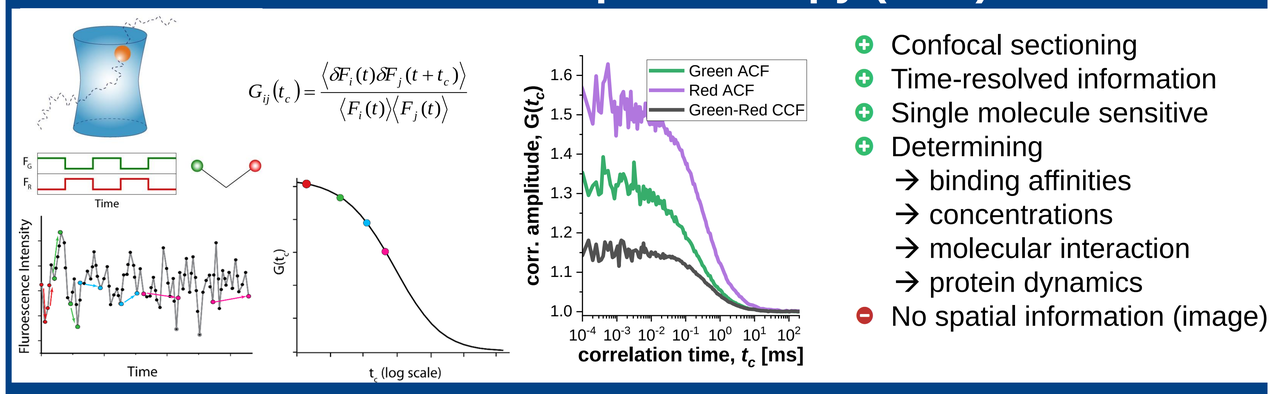
- ⊖ High risk of photobleaching
- ⊖ Low sample penetration
- ⊖ Slow

Fluorescence Lifetime Imaging Microscopy (FLIM)



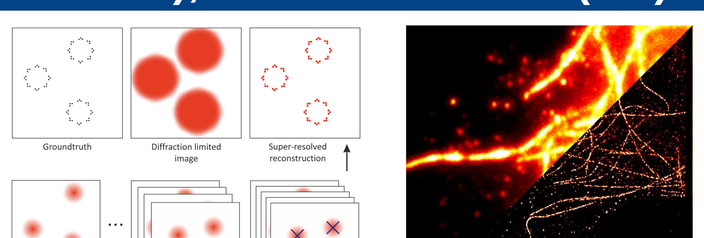
- ⊕ Time-resolved information
- ⊕ Confocal sectioning
- ⊕ Anisotropy
  - → Binding/Rotation
  - → Interactions (homoFRET)
- ⊕ FRET
  - → protein-protein interaction
  - → structural information
  - → Biosensors
- ⊖ Slow

Fluorescence Correlation Spectroscopy (FCS)



- ⊕ Confocal sectioning
- ⊕ Time-resolved information
- ⊕ Single molecule sensitive
- ⊕ Determining
  - → binding affinities
  - → concentrations
  - → molecular interaction
  - → protein dynamics
- ⊖ No spatial information (image)

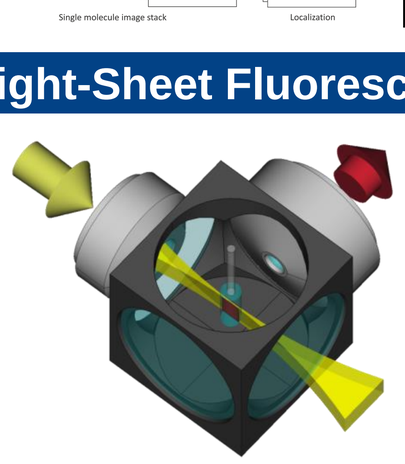
Direct Stochastic Optical Reconstruction Microscopy (dSTORM), mirror enhanced (me)STORM

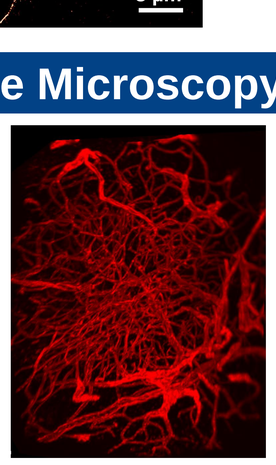


- ⊕ Camera-based acquisition
- ⊕ Single molecule detection
- ⊕ Super-resolution

- ⊖ Very limited choice of dyes
- ⊖ Limited live cell compatibility
- ⊖ Slow

Light-Sheet Fluorescence Microscopy (LSFM)





- ⊕ 3D imaging of large specimen with cellular resolution
- ⊕ Fast camera-based acquisition
- ⊕ Multi-color

- ⊖ Limited choice of dyes
- ⊖ Optical clearing required
- ⊖ Long sample preparation
  - → low throughput

Katrin

Mike

Katherina

Jürgen

Joachim

Welcome to our Imaging Facility!

PLAN and familiarize yourself with all facility rules.

BOOK off-peak times if possible, or schedule long experiments overnight.

LOG OUT after closing all windows on the computer to secure and protect your data.

Software

Fiji

Huygens

Imaris

arrivis

Ilastik/Labkit

SymPhoTime

COMSOL

JupyterHub

MatLab

CRC/TRR 225
From the fundamentals of biofabrication towards functional tissue models

IZKF Würzburg

CRC/TRR 124
Pathogenic fungi and their human host: Networks of interaction

Micro-Patterning System (PRIMO)

- Property of Prof. Dr. Markus Bender (JMU)
- Hosted by the CU Imaging
- Attached to widefield microscope
- Protein micropatterns in cell culture substrates

- ⊕ Cell migration & adhesion
- ⊕ 3D confinement
- ⊕ microfabrication
- ⊖ Slow

Computational & Data Analysis Resources