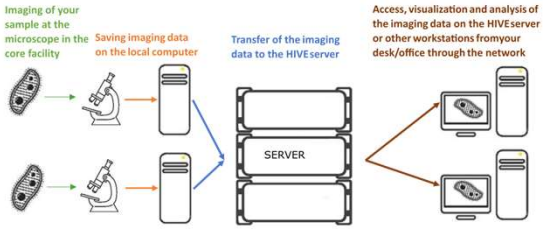
Advanced Light Microscopy Node Poland

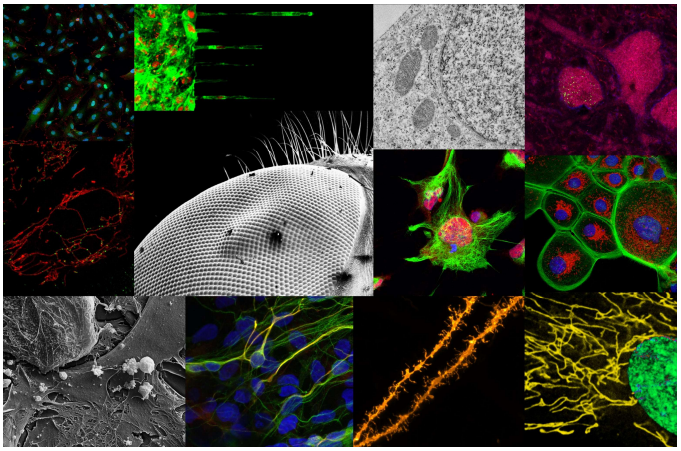
Małgorzata Całka, Natalia Nowak, Małgorzata Śliwińska, Artur Wolny, Jędrzej Szymański*
Nencki Institute of Experimental Biology PAS, Pasteur Street 3, 02-093 Warsaw, Poland
j.szymanski@nencki.edu.pl

Dedicated staff can help you whether you have never seen a microscope before or if you are more experienced user:
- Training and advice for systems tailored to your needs
- Advice on experimental strategies and sample preparation
- Ongoing support and further training



The "Advanced Light Microscopy Node Poland" is coordinated by the Nencki Institute of the Polish Academy of Sciences (PAS) and includes Jagiellonian University and Mossakowski Medical Research Centre, with sites in Warsaw and Cracow. Another institutions in Poland express their interest in joining our Node.

Nencki Institute began the implementation of the NEBI Project - National Centre for Advanced Analysis of Biological and Biomedical Imaging. The project aims to create the National Centre for Advanced Image Analysis in Biological and Biomedical Sciences - an advanced IT infrastructure for data collection and processing, and to create a state-of-the-art integrated platform for multidimensional imaging of biological processes that are crucial for appropriate functioning of the organism as well as underlying civilization diseases.



Electron microscopy

SEM Zeiss Sigma VP with Gatan 3View

JEM 1400 (JEOL)

Confocal laser scanning microscopy
Zeiss 800 with Airyscan Detector
•AiryScan super-resolution mode
•F-technics: FRET (acceptor photobleaching), FRAP and FLIP
Zeiss LSM 780
•Lambda Scan (parallel or sequential acquisition of image stacks with spectral information for every pixel)
•CLEM (Correlative Light Electron Microscopy)
•Live cell imaging
•F-technics: FRET (acceptor photobleaching), FRAP i FLIP
Leica SP 8
•Lambda Square Mapping
•CLEM (Correlative Light Electron Microscopy)
•Live cell imaging
•F-technics: FRAP, FRET (acceptor fotobleaching), FRET-FLIM, FLIP, FLIM
•Fluorescence correlation spectroscopy (FCS)
Stellaris STED-DLS
•DLS – digital light sheet
•STED superresolution imaging (775 nm pulsed depletion laser)
•Confocal imaging with White Light Laser source

Widefield Fluorescence Microscope:
Leica AF 7000
•Transmitted light and transmitted light contrast techniques (DIC, POL)
•Widefield fluorescence visualization
•Time series, z-stacks, tile scans and combination of mentioned applications
•Calcium ion concentration analysis [FURA2]
•Interference reflection microscopy
•Long-term live cells experiments
•Interference reflection microscopy
Leica DMI 6000
•Transmitted light and transmitted light contrast techniques (DIC, PH)
•Histological samples visualization with color camera
LEICA DMI 8
•Transmitted light and transmitted light contrast techniques (DIC, PH)
•Widefield fluorescence visualization
•Time series, z-stacks, tile scans and combination of mentioned applications
•Long-term live cells experiments
•Navigator Module for sample preview and advanced TileScan acquisition
OLYMPUS VS 110
•Transmitted light visualization
•Widefield fluorescence visualization
•Time series, z-stacks, tile scans and combination of mentioned applications
•Histological samples visualization
•Possibility of fully automated scan up to 5 samples
•Fluorescence Microscope Slide Scaner

Spinning disk confocal microscopy
Zeiss Spinning Disk
DSD2 Andor with Leica DMi6000
•Z-stacks, tilescan, position and time series
•Live cell imaging
•FRET Sensitized Emission
•Simultaneous detection of two fluochromes due to the use of two cameras
•Fast acquisition

Multiphoton microscopy
Zeiss LSM7 MP for ‚In Vivo' measurements
Zeiss LSM7 MP for ‚imaging and photomanipulation'
•Possibility of visualization fluorescence staining in living animals, organoids.
•Time series, z-stacks, and combination of both applications
•Technics which require photomanipulation (FRAP (Fluorescence recovery after photobleaching), FLIP (Fluorescence Loss in Photobleaching), Visualization of „cage compound")

TIRF based microsopy systems
Zeiss TIRF & ONI (nanoimager – coming soon!)
- Flurescence visualization with illumination light in widefield, HILO or TIRF mode
- Two channel Detection with fast camera with the use of optosplit
- Superresolutoin imaging based on Single Molecule Localization Method (SMLM)

Automated system for widefield + confocal
Zeiss Celldiscoverer 7 wit LSM 900
•Transmitted light and transmitted light contrast techniques (PCG)
•Widefield fluorescence visualization
•Confocal laser scanning acquisition
•Superresolution live cell imaging (AiryScan 2)
•Overview of the whole sample and possibility to visualize chosen regions
•Time series, z-stacks, tile scans and combination of mentioned applications
•Long-term live cells experiments up to 72 h

Microdissection system
Leica LMD7
- Laser microdissection (LMD) is a technique which allows users to selectively cut out regions of interest from a sample using a high-power laser. The extracted regions can then be collected specifically and subjected to further experiments, which may involve DNA, RNA and proteomic analysis.

Holotomography system - Nanolive CXA
- Automated live cell imaging and analysis: a unique walk-away solution for long-term live cell imaging of single cells and cell populations
- Marker-free, 3D imaging of live cells
- The 3D Cell Explorer measures the quantitative Refractive Index (RI) of cell organelles in seconds and 3D

This work was supported by the project financed by the Minister of Education and Science based on contract No 2022/WK/05