

AMBIO Imaging Systems Applications Guide

*main imaging feature(s)

System/ Microscopy Mode	Sample/ Application
Widefield (Ti2)	
Bright-field microscopy	- Stained histology slides
Widefield EPI fluorescence (CFP, GFP, YFP, mCherry, Cy5)	(DAPI, - Fixed/ live-cell culture and organoids - NIS-Elements deconvolution and artificial intelligence (Ai) modules
Fast high-throughput screening*	- Large image scan - Multi-position/ multiwell plates - Long-term live-cell imaging - High resolution (water immersion objectives/ automatic dispenser) - Automated acquisition (NIS-Elements JOBS module) - FRET
Phase-contrast microscopy	- Automated phase for 10x/ 20x objectives
Polarized light microscopy	- Oxalate crystals
Point Scanning Confocal (A1)	
Widefield EPI fluorescence (GFP, mCherry)	(DAPI, - Fixed/ live-cell culture and thin tissue (<200 µm) - NIS-Elements deconvolution
High resolution confocal microscopy* (GFP, mCherry, Cy5)	(DAPI, - 3D fixed/ live-cell culture and thin tissue - Spectral imaging/ unmixing - Detection of transmitted light - Large image scan - High speed resonant scanning (live-cell)
Photomanipulation	- FRAP, photo-activation/ switch, ablation, optogenetics
Spinning Disk Confocal (CSU-X)	
Fast spinning disk confocal microscopy* (DAPI, GFP, mCherry, Cy5)	- 3D live-cell culture and very thin tissue (<100 µm) - Ultra-fast dual color imaging - FRET - Long-term live-cell imaging - Large image scan - Multi-position/ multiwell plates - High resolution (oil/ water immersion objectives) - Automated acquisition (NIS-Elements JOBS module)
Photomanipulation	- FRAP, photo-activation/ switch, ablation, optogenetics
Spinning Disk Confocal (CSU-W1 SoRa)	
Fast spinning disk confocal microscopy* (DAPI, CFP, GFP, YFP, mCherry, TxRED, Cy5)	- 3D live-cell culture and very thin tissue (<100 µm) - Ultra-fast dual color imaging - Super resolution mode (SoRa, 1.4x resolution improvement) - FRET - Long-term live-cell imaging - Large image scan - Multi-position/ multiwell plates - High resolution (water immersion objectives/ automatic dispenser) - High depth resolution (silicone immersion objectives) - Automated acquisition (NIS-Elements JOBS module)
Photomanipulation	- FRAP, photo-activation/ switch, ablation, optogenetics
Widefield EPI fluorescence	(DAPI, - Live-cell culture and very thin tissue

GFP, TxRED, TRITC-B, Cy5) - NIS-Elements deconvolution and artificial intelligence (Ai) modules

Upright Spinning Disk Confocal (USDC S2)

Fast spinning disk confocal microscopy (DAPI, GFP, mCherry, Cy5) - 3D fixed/ live-cell culture, organoids and embryos
- **Intravital microscopy***
- Long-term live-cell imaging
- Large image scan
- Multi-position

Lattice Lightsheet

Volumetric imaging of adherent cells, spheroids, organoids, cysts, and cells in hydrogel (GFP, mCherry, Cy5) - **Fast 3D live-cell with minimal phototoxicity and bleaching***
- Spheroids and organoids (diameter up to 200 μ m)
- Development of small organisms/embryos
- Long-term live-cell imaging
- Multi-position/ multiwell plates
Photomanipulation - FRAP and photo-activation/ switch (1-photon: 405 and 473 nm)
- Ablation experiments in a 3D focal spot (2-photon: 780 nm)

Multiphoton Confocal (Upright)

Multiphoton confocal microscopy* (tunable (680 – 1300 nm) and (1040 nm) lines) single - 3D live-cell culture, organoids and embryos
- **Intravital microscopy***
- High penetration depth

TIRF/ Single Molecule Super-Resolution

Widefield EPI fluorescence (DAPI, GFP, mCherry, Cy5) - Fixed/ live-cell culture and organoids

Single-molecule localization microscopy* - dSTORM (fixed cells)
- DNA-PAINT (fixed cells)

Total internal reflection fluorescence (TIRF)* - Adhesive cell membrane
Contrast enhancement - External phase contrast (40x/ 100x objectives)
- DIC (40x/ 100x objectives)

Photomanipulation - FRAP, photo-activation/ switch, ablation, optogenetics

Interference reflection microscopy (IRM) - Adhesive cell membrane

Surface plasmon resonance imaging (SPRI) - Molecular adsorption (DNA, proteins, polymers) and immuno assays

Luciferase assay - Cell lysates