12/04/2022

IGTP Microscopy Platform

Zeiss Axio Observer Z1 widefield and LSM 710 confocal microscope system specifications

The system is built on the XYZ motorized Zeiss Axio Observer Z1 inverted microscope body for widefield brightfield/epifluorescence or confocal imaging via LSM 710 module. It is equipped with the following objectives and epifluorescence filters:

Objectives

Magnification	Numerical Aperture (NA)	IMM	Working Distance (mm)	Cover glass (CG) thickness (mm)	Aberration Correction	Contrast technique
10X	0.3	DRY	5.6	0.17	Plan-Neofluar	Ph1
20X	0.4	DRY	8.4 @ 0 CG, 7.4 @ 1.5 CG	0 - 1.5	LD Plan-Neofluar/Corr	Ph2
40X	0.6	DRY	3.3 @ 0 CG, 2.5 @ 1.5 CG	0 - 1.5	LD Plan-Neofluar/Corr	Ph2
40X	1.3	OIL	0.21	0.17	Plan-Apochromat	DIC
63X	1.4	OIL	0.19	0.17	Plan-Apochromat	DIC

Ph – Phase Contrast, DIC – Differential Interference Contrast

Epifluorescence Filters

Filter Set	Excitation filter	Dichroic mirror	Emission filter	Example fluorophores
Set 1	BP 365/12	FT 395	LP 397	DAPI, Hoechst
Set 38 HE	BP 470/40	FT 495	BP 525/50	AF488, eGFP, mNeonGreen
Set 20	BP 546/12	FT 560	BP 575-640	AF568, Cy3, mCherry

BP – Bandpass filter, *FT* – Farbteiler (*dichroic beamsplitter*), LP – Longpass filter

Laser lines

- Diode laser: 405 nm
- Multiline Argon laser: 458/488/514 nm
- HeNe laser: 543 nm (polarized)
- HeNe laser: 594 nm (polarized)
- HeNe laser: 633 nm (polarized)

Detectors

For widefield imaging this system is equipped with Zeiss AxioCam MRm 1.4MP monochrome CCD camera. For confocal fluorescence imaging via LSM 710 module this system is equipped with 3 detectors/channels: 2 PMTs (25% QE) and a 32 GaAsP PMT spectral array (45% QE).

32 GaAsP PMT spectral array allows for simultaneous acquisition of up to 32 spectral detection channels (9.7 nm each) for fast spectral (Lambda) scanning. This mode is useful for spectral unmixing of fluorophores with similar emission characteristics or fast imaging of environment sensitive dyes such as Laurdan.

Environmental Control

This system is equipped with a full box enclosure and can be operated with the temperature and CO_2 control. Pecon heating inserts for 24-well plates, Petri dishes or microscope slides are also available.

Software

The system is controlled via either Zeiss ZEN Blue 2012 (widefield imaging) or Zeiss ZEN Black 2011 (confocal imaging).