Cellular Imaging Core Facility - CELLIM

Zeiss Elyra 7 with Lattice SIM

Location:
CELLIM, building C2, room 1.13a

Booking alias:
Elyra7-A2

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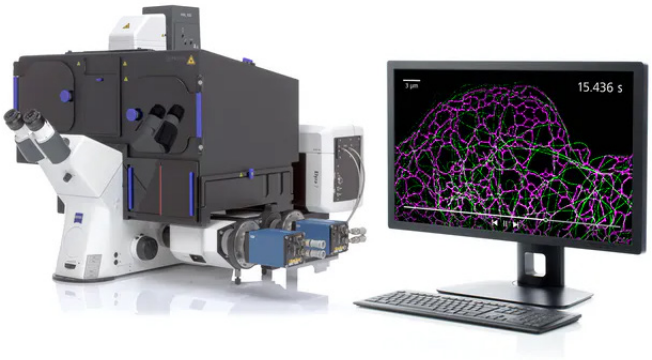


Manual:

SCAN ME

Reservations:

https://booking.ceitec.cz/PlanningBoard.html

Overview:

The Elyra *7* is a motorized inverted microscope with resolution beyond the Abbe diffraction limit of the conventional light microscope. The microscope is equipped with a super-resolution system that uses a specialized lattice illumination pattern for 3D structured illumination (SIM) images and single-molecule localization methods (SMLM) like STORM and PALM. SIM is a technology that can be used with standard fluorophores, making it an easily accessible choice for super-resolution results. The lattice illumination allows for faster, gentler, and deeper imaging of live samples, and can reach up to 255 FPS during time-lapse acquisition. The unit has an incubation chamber for live imaging with controlled CO2 and temperature. For fast and precise Z-movement there is a piezo Z stage insert. The system yields up to 8-fold improvement in voxel resolution in the X, Y, and Z dimensions. The microscope is equipped with four solid-state lasers (405, 488, 561and 642 nm). The signal detection is assured by two sCMOS cameras which enable simultaneous detection of two different fluorophores.

Specifications:

Objectives
Plan-Neofluoar 10x / 0.30 AIR,
C-Apochromat 40x / 1.20 W,
Plan-Apochromat 40x / 1.40 OIL,
Plan-Apochromat 63x / 1.46 OIL,
Plan-Apochromat 100x / 1.46 OIL,
Plan-Apochromat 100x / 1.57 OIL-HI

Lasers
405 nm, 488 nm, 561 nm, 642 nm
Lasers shared between Lattice SIM and SMLM

Camera
PCO edge sCMOS camera, 1280 × 1280; pixel size 6.5 µm × 6.5 µm

Software
Zen Black

Filters for fluorescence
F-set *77* HE – DAPI, GFP, mRFP, Alexa 633

Duolink filter sets
SR SOLO, SR DUO, SR Quad

Filters for SIM and SMLM
FLEX, FLEX min, PURE, QUAD only

Detailed description:

Duolink filter sets

SCAN ME

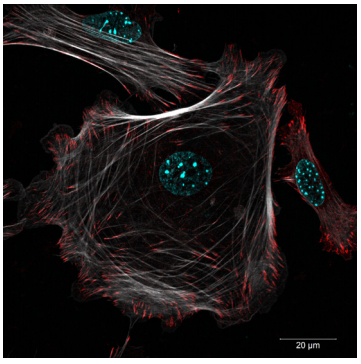
Filter sets for SIM and SMLM

SCAN ME

Examples:

Apotome visualistion of Actin filaments and focal adhesion in Mouse Embryonic Fibroblast.

Cyan DAPI: DNA, Red Alexa Fluor 568, White Phalloidin Alexa 488: Actin filaments. Objective: Plan-Apochromat 40x / 1.4 Oil. Final image was obtained using ZEN SIM processing.



Mitochondia of endothelial cells stained with Mitotracker-RED.

Picture ***A*** was acquired using standard widefield microscopy. The same position was acquired using lattice SIM modality of Elyra *7* (picture ***B***). There are clear resolution improvements and inner structures of mitochondria are revealed, otherwise invisible under a standard widefield microscope.