

Zeiss Celldiscoverer 7 – High throughput live cell imaging

Objectives lenses:

Plan-Apochromat 5x/0.35 (Extra-large field of view with low resolution)

Plan-Apochromat 20x/0.7 autocorr (Large field of view with medium resolution)

Plan-Apochromat 20x/0.95 autocorr (Large field of view with high resolution)

Plan-Apochromat 50x/1.2 W autocorr with auto-immersion (Medium field of view with very high resolution)

* in combination with afocal magnification changer 0.5x / 1x / 2x, the system has wide range magnifications of 2,5x - 100x

Reflected-light illuminator FL for up to 7 LEDs:

385 / 420 / 470 / 520 / 567 / 590 / 625 nm

Emission Filters:

Filter Set 90 HE for Celldiscoverer 7 (E) quadruple filter set for the excitation wavelengths 385nm, 470nm, 555nm and 625nm, consisting of: RQBS 405+493+575+653 EM QBP 425/30+514/30+592/25+709/100

Filter Set 91 HE for Celldiscoverer 7 (E) triple filter set for the excitation wavelengths 420nm, 520nm and 590nm, consisting of: RTBS 450+538+610 EM TBP 467/24+555/25+687/145

Filter Set 92 HE for Celldiscoverer 7 (E) triple filter set for the excitation wavelengths 385nm, 470nm and 590nm, consisting of: RTBS 405+493+610 EM TBP 425/30+524/50+688/145

Single Bandpass GFP emission filter

Internal Camera:

Camera Axiocam 712 mono

Additional Camera:

Prime 95BTM Back Illuminated Scientific CMOS

1200x1200 pixels, back thinned sCMOS, 11x11um square pixels, @18.7mm field of view, 95% quantum efficiency, 16-bit data@41fps / 12-bit, data@82fps, read noise 1.6e-, air cooled to -20C.

Incubator:

TempModule S1 for basic stack module for temperature control of sample chamber
Resolution: 0.1° C - temperature accuracy: +/- 0.1°C

Refrigerated circulator Corio CP-200F - for sample temperature control from 0°C to 45°C

CO2 Module S1 - stack module for CO2 control - CO2 concentration adjustable between 1 and 8% - precision +/- 0.1%

POC-R2 cell cultivation system for perfusion, open and closed cultivation

Stage controllers:

Fully Motorized Stage XYZ

Definite Focus.2 for focus correction in long lasting experiments

Workstation and Software:

Microscopy Workstation Premium hp Z6 G4 Processor Intel Xeon Gold 5222, 32GB RAM, Graphics Card NVIDIA Quadro RTX4000 8 GB, 1TB OS SSD, Hard Drive Extension 12TB RAID10. ZEN 3.5 Celldiscoverer Image acquisition and processing.

Image analysis Tools:

ZEN Module APEER (on-site) Advanced Module allows to enhance the functionalities of ZEN by integrating image processing and analysis tools from the APEER platform.

ZEN Module Guided Acquisition Allows to define automatic and targeted acquisitions of objects of interest (e.g. rare events).

ZEN Module Direct Processing The module permits the processing of images directly during acquisition.

ZEN Intellesis Segmentation Simple and user-friendly tool for image segmentation using machine- learning methods incl Deep Learning approaches.

ZEN Module Confluency Automated quantification of the area covered by cells.

ZEN Module gene + protein expression Automated quantification of gene and protein expression levels.

ZEN Module Automated Spot Detection Automated counting and quantifying spots inside the cell nuclei.

ZEN Module Macro Environment Integrated Development Environment (IDE) with editor, debugger and recorder*. Enables intermediate Users to customize and automate ZEN for their needs with a selected set of commands.