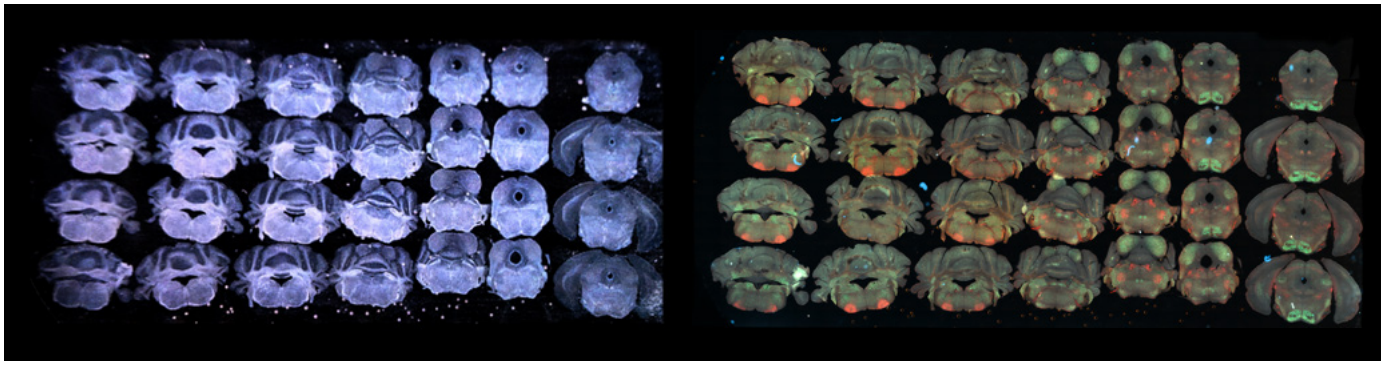
Fast acquisition and evaluation of large areas

ZEISS Microscope Bundle for Screening Applications



Darkfield Composite Contrast image (left) and fluorescence image (right) of brainstem 80 um-thick sections. Labeling of excitatory neurons with GFP (nuclear), and signal amplification with anti-GFP and Alexa 488-conjugated secondary antibodies, counterstained with anti-ChAT (motor neurons) and Alexa 647-coupled secondary antibodies. Courtesy of Silvia Arber and Staci Thornton, FMI.

Large area imaging has become an important application in various research fields. Regardless of whether tissue, plants, whole specimen or cell cultures are to be imaged, the combination of excellent image quality and high throughput is crucial for obtaining statistically meaningful data. At the same time, the amount of data produced is continuously increasing, making data organization and automated analysis more important than ever. Modern microscopes must therefore be able to handle different carriers, perform complex experiments automatically, and provide tools for evaluating large amounts of data.

The ZEISS Bundle for Screening Applications

The system bundle was assembled to support high-throughput screening applications.

Hardware

With AI Sample Finder, your experiment start has never been simpler and faster. Overview images are acquired with ease, allowing intuitive and efficient navigation. The Colibri 7 light source allows to excite fluorophores at seven different wavelengths and the filter sets cover the full visible spectrum range for highest spectral flexibility. The objectives with low and high magnifications provide highest flexibility with respect to required resolution and acquisition speed. With the sensitive camera Axiocam 705, even dim signals can be detected, enabling to minimize exposure times for fastest acquisition.

Software

The bundle includes software modules for acquisition and analysis. Guided Acquisition allows you to identify rare events to automatically image these locations with higher magnification or in 3D. ZEN Connect automatically groups individual images to projects while the location of every image is visualized relative to others. This gives you full traceability and allows to consider the environment when evaluating your data. Image segmentation can be easily achieved with the machine learning power of ZEN Intellesis. Segmentation and analysis of your data is done by defining objects without the need for programming skills.

ZEISS Microscopes for Screening Applications

The Bundle Components

Microscope

- Axio Observer 7 (inverted)
- Axio Imager 2 (upright)
- Scanning stage 130 × 100
- Mot. Condenser NA 0.55[1] / NA 0.9[2]
- AI Sample Finder[1]
- Definite Focus 3

Light source / camera

- Colibri 7
- Filter sets HE LED 90, 91, 112
- Axiocam 705 mono

Objectives

- EC Plan-Neofluar 5×/0.16[1]
- Fluar 5×/0.25[2]
- Plan-Apochromat 20×/0.8
- Plan-Apochromat 40×/0.95 Corr

Workstation

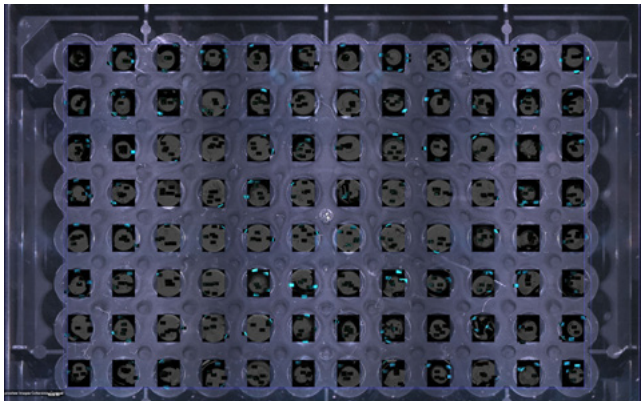
- Z6 Workstation with 32 GB RAM and nVidia Quadro RTX4000 8 GB

[1]Axio Observer 7, [2]Axio Imager 2

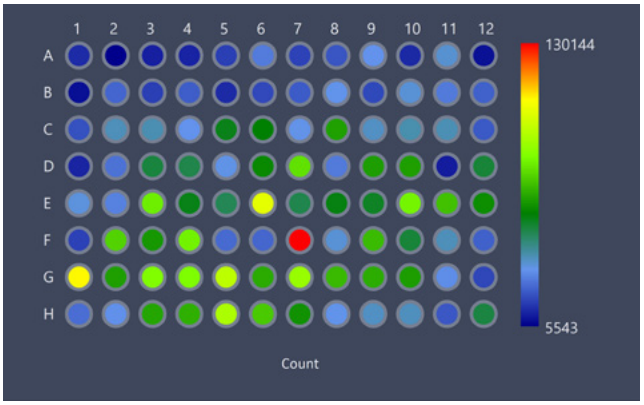
Depending on your application needs, you can either choose an inverted configuration based on ZEISS Axio Observer 7 (left) or an upright configuration based on ZEISS Axio Imager 2.

ZEN software modules

- Z stack: Acquire Z stacks with the help of a motorized focus drive.
- Tiles & Positions: Generate precise, high-resolution images through automatic scanning of predefined regions and positions of a sample.
- Guided Acquisition: Perform fully automated targeted acquisition of objects of interest.
- Software Autofocus: Determine the optimum focus position of the specimen.
- Time Lapse: Acquire images over a period of time.
- ZEN Connect: Visualize data from different modalities for best overview and correlation.
- 3Dxl: Visualize 3D/4D image stacks.
- ZEN Intellesis: Enable machine-learning algorithms to segment images.
- APEER: Cloud-based platform to solve your microscopy image processing tasks.



Overview image of a 96-well plate showing the exact position of the obtained transmitted light and fluorescence images.



Heatmap of the cell count evaluation of a 96-well plate allows to quickly identify wells containing high and low number of cells.

microscopy@zeiss.com
www.zeiss.com/microscopy

Seeing beyond