

3D Image Analysis Module

For MetaXpress High-Content Image Acquisition and Analysis Software

BENEFITS

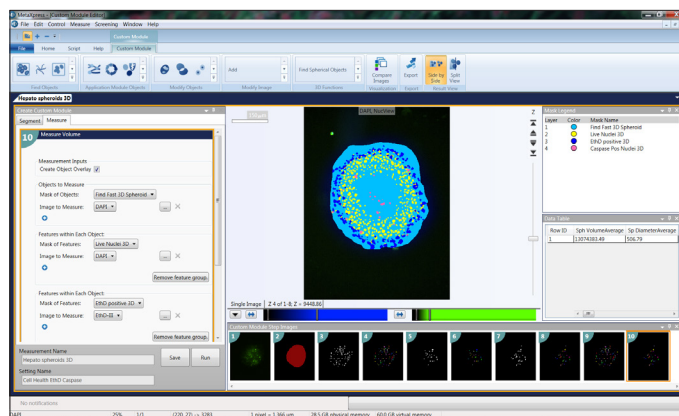
- Simplify viewing and quantification of 3D structures
- Quickly access images and analysis results together
- Segment and score in 3D volumes

Complex assays and three-dimensional cell models better represent tissue biology and cell interactions, making them more relevant for many toxicity and drug screening assays. The ability to use 3D models in a high-throughput, high-content format is a significant benefit for scientists. The 3D Image Analysis Module for MetaXpress® Software is designed to analyze spheroids, microtissues, cells in a 3D matrix, and small organisms that are acquired as a stack of z-planes.

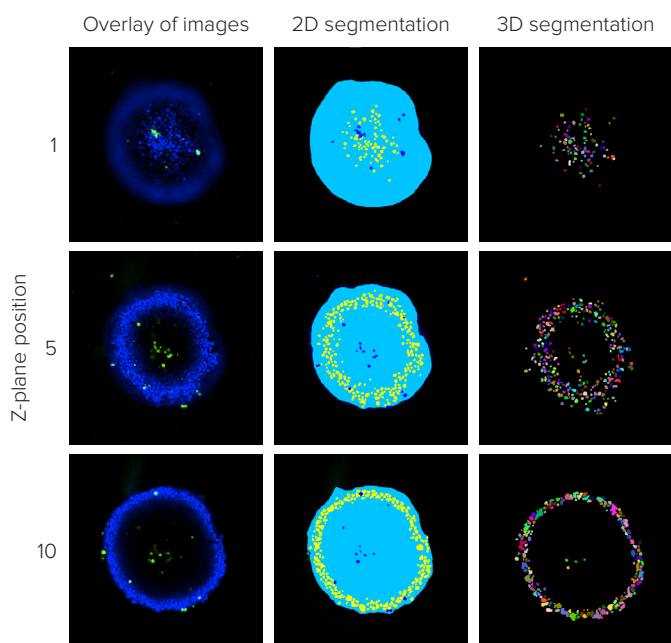
The integrated software interface enables researchers to quickly access the images and analysis results together to distinguish differences in spheroid morphology, cell division, apoptosis, or mitochondria shape in a 3D environment. The module reconstructs the z-stack into a 3D object so appropriate segmentation of features can be performed. Analysis begins with segmentation of individual z-planes as 2D images for measurements such as nuclei count, live/dead categorization, and cell scoring. Then objects are connected in space by a user selected algorithm. As a result, nuclei, individual cells, or whole spheroids are segmented and scored in the 3D volume without missing objects or counting any object twice.

A single, integrated 3D analysis solution

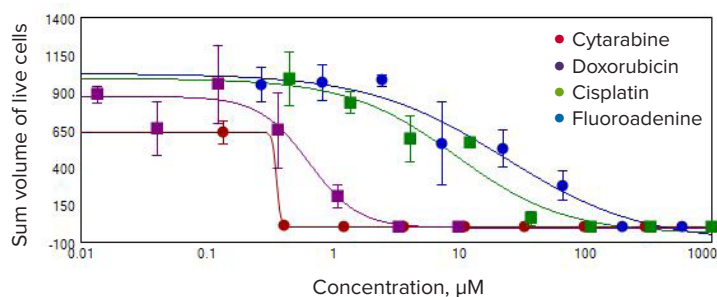
- Analyze three dimensional images from 2D and 3D assays**
 Study reactions within individual cells in standard monolayer cultures or measure responses in whole small organisms
- Segment images using advanced tools**
 Define co-localization, neurite outgrowth, and numerous morphological characteristics of individual cells as separate objects
- Convert 2D images into a 3D object with powerful connection rules**
 Segment and score nuclei or individual cells in the 3D volume without missing objects or counting any object twice
- Explore data in new ways**
 Rotate, zoom, and overlay images to visually verify segmentation in 3D
- Quantify your 3D measurements**
 Measure a number of informative phenotypic readouts that enable screening for drug activity or for toxicity of test compounds
- Choose from a rich set of 3D measurements**
 Evaluate volume, XYZ location, distance to neighboring objects, diameter, depth, various intensity measurements, texture, or number of objects
- Visualize raw images with segmentation in 3D**
 Generate interactive, high-resolution renderings and see 3D visualization for each step of your module
- Render a movie of your 3D images or segmentation masks**
 Export 3D movies for presentation and to share your results
- Eliminate transfer issues and delays between acquisition and analysis software**
 Analyze and assess images and results using a single, integrated software



The Custom Module Editor provides tools for sophisticated analysis of both 2D and 3D assays. The 3D analysis functions enable simple analysis of objects in the 3D volume.



Segmentation of a spheroid at different z-planes. Objects visible in different z planes may be analyzed independently or joined together using powerful connection algorithms.



Analysis using a four-parameter curve fit to determine dose-dependent effects for selected compounds. The sum volume of live cells/spheroid is calculated within the 3D volume and is one example of a 3D phenotypic readout.

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