

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

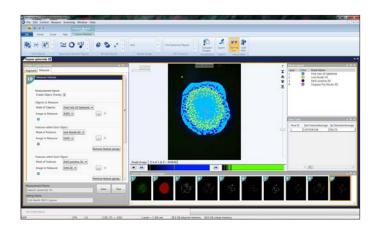
Segment and score nuclei or individual cells in the 3D volume without missing objects or counting any object twice

- 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

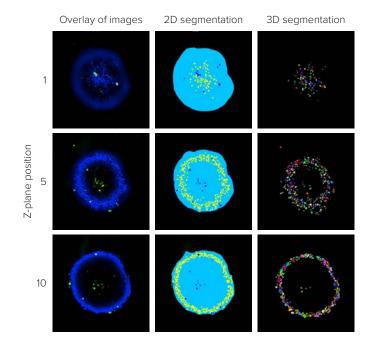
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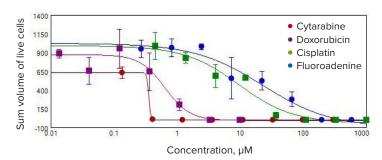
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The Custom Module Editor provides tools for sophisticated analysis of both 2D and 3D assays. The 3D analysis functions enable simple analysis of objects in the 3D volume.



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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