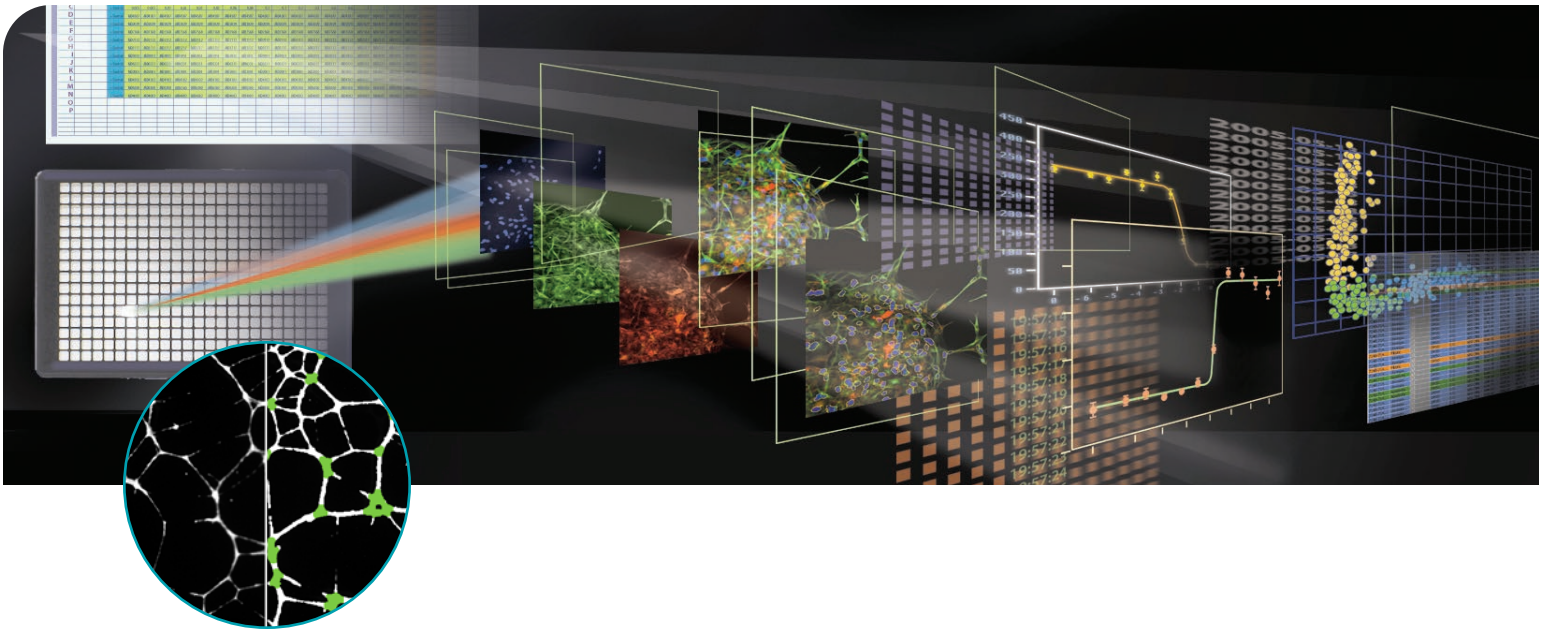
Molecular Devices

MetaXpress Software Angiogenesis Application Module

ANALYSIS DROP-IN FOR METAXPRESS SOFTWARE AND METAXPRES POWERCORE HIGH-THROUGHPUT IMAGING OPTION



- UNIQUE Z-SERIES ACQUISITION
- BETTER RESULTS DUE TO COLLAPSING MULTIPLE PLANES INTO ONE IN-FOCUS IMAGE
- SUPERIOR SEGMENTATION ALGORITHMS AND ADAPTIVE BACKGROUND CORRECTION
- MULTI-PARAMETER ANALYSIS AND FURTHER CUSTOMIZATION THROUGH MACROS
- FASTEST ANALYSIS WITH ON-THE-FLY CELL COUNTING AND THE METAXPRESS POWERCORE HIGH-THROUGHPUT IMAGING OPTION

Angiogenesis is the growth of new blood vessels and is an important natural process occurring in the body, both in health and disease. Angiogenesis occurs in the healthy body for healing wounds and restoring blood flow to tissues after injury or insult. In many serious diseases, the body loses control over angiogenesis. Angiogenesis-dependent diseases—such as cancer, diabetic retinopathy, psoriasis, coronary artery disease, stroke and rheumatoid arthritis—result when new blood vessels either grow excessively or insufficiently.

One of the morphological changes that can be observed in angiogenesis is tube formation. To mimic natural tube formation *in vitro*, cells are grown in a three-dimensional matrix and tubes, reminiscent of the *in vivo* behavior develop.

Tube formation in three dimensions poses significant image analysis challenges. Indeed, while some tubes develop parallel to the surface, uneven surfaces drive some tubes to grow perpendicular to it instead. The Angiogenesis Application Module for MetaXpress® Software from Molecular Devices is designed to tackle the challenges of the analysis of tube formation assays with a unique image processing approach and a simple set-up. The module also provides the fastest image acquisition and analysis through integration with Molecular Devices' complete solution for cellular imaging.

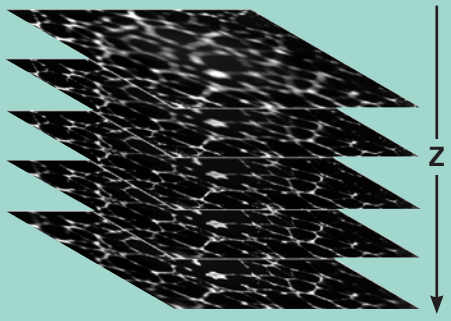
A UNIQUE IMAGING APPROACH

To capture the three-dimensional behavior of cells, MetaXpress Software allows for a unique z-series acquisition and the collapse of all the z-series in a single "best focus" image.

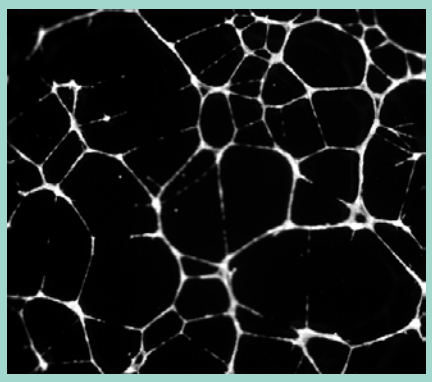
The module utilizes Adaptive Background Correction (ABC) which adapts the vessel detection algorithm to the local intensity ranges outside the vessels to provide the most robust segmentation available in an image-based screening system. ABC enables vessel detection even with highly variable background fluorescence within a single image.

A Unique Approach to Tube Formation Analysis

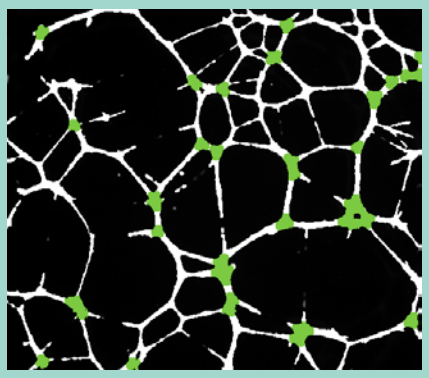
A



B



C



A: Raw Z-Series image from the BD BioCoat Angiogenesis System (courtesy of Min Wu, BD Biosciences).

B: The raw z-series image is collapsed into one best-focus image.

C: The Angiogenesis module in MetaXpress Software identifies tubes (white) and nodes (green).

EASY CONFIGURATION AND MULTI-PARAMETRIC ANALYSIS

A simple interface minimizes setup efforts and analysis settings can be configured once and saved for future use or customized to fit a specific experiment.

1. Select the image of interest
2. Specify the minimum and maximum tube widths
3. Set the intensity above local background
4. Optionally specify the reporting parameters

The module generates 14 parameters for each image, including:

- Total tube length
- Total tube area
- Mean tube thickness
- Number of segments
- Number of branch points
- Number of nodes
- Total area of nodes
- Mean node area

FURTHER CUSTOMIZATION THROUGH MACROS

MetaXpress Software and the Angiogenesis Application Module are seamlessly integrated with the flexibility of MetaMorph® Software and its advanced automation macros. These powerful macros record and perform a series of tasks without the user having to know a programming language.

THE FASTEST WORKFLOW FROM ACQUISITION TO HIT SELECTION

Image acquisition with ImageXpress® Instrumentation provides the fastest reading times for large libraries and a great flexibility in acquisition set-up for research through screening.

Image analysis can be distributed to the MetaXpress® PowerCore™ high-throughput image analysis platform, providing unparalleled performance in the race to identify "hits." Increasing image analysis speed by 10-to 30-fold virtually eliminates image analysis bottlenecks and enables multiple ImageXpress systems to run in parallel.

High-end hit selection and quality control is available through AcuityXpress™ Software, the data analysis software integrated to the Complete Imaging Solution from Molecular Devices.

AcuityXpress Software features Interactive Image Zoom drill down for bidirectional interaction between images and numerical data.

ORDERING IN FORMATION

Angiogenesis Application Module for MetaXpress Software
Part Number: 9500-0016

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