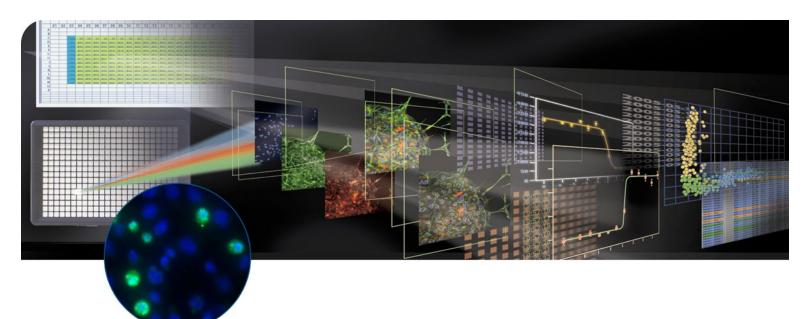# Molecular Devices

MetaXpress Software
Mitotic Index Application Module

ANALYSIS SOFTWARE DROP-IN FOR METAXPRESS SOFTWARE

→ QUANTITATION OF MITOTIC AND INTERPHASE CELLS

→ MULTI-PARAMETER ANALYSIS OF TWO PROBES

→ ADAPTIVE BACKGROUND CORRECTION FOR IMPROVED SEGMENTATION

→ CELL-BY-CELL MEASUREMENTS AND DATA LOGGING

Cell-based assays for cell cycle status have become critical for oncology drug discovery programs. For example, potential anti-cancer therapeutics rely on arresting mitotis in cancerous cells to prevent uncontrolled proliferation.
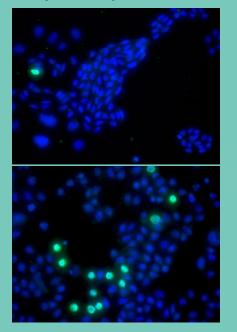
In some forms of cancer, progression through mitosis can be stopped by merely disrupting the mitotic spindle. In others, the feedback is missing and cells proceed through mitosis without proper chromosome segregation and accumulate mutations. Cell-based assays provide an efficient method for modeling the effects of drugs on the cell cycle and quantitating the accumulation of cells in mitosis.

The Mitotic Index Application Module for MetaXpress® Software from Molecular Devices is designed for the quantitative discrimination of mitotic and interphase cells.

Cells are labeled with a DNA stain and a fluorescent mitosis-specific marker, such as immunofluorescence staining for Histone 3 S10 phosphorylation. Two different wavelengths are acquired and the images are analyzed with the Mitotic Index module.
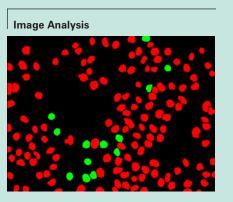
A simple interface minimizes setup efforts and settings can be saved for future use. Segmentation parameters are set for each wavelength detection and the assay is run for a site, selected wells, the entire plate or multiple plates.

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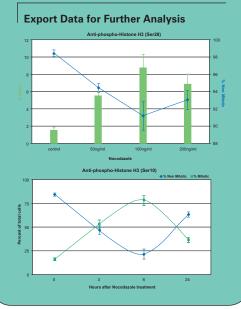
Multiple Probe Acquisition

CHO-K1 cells treated with Nocadazole for 18 hours before staining with anti-phospho-Histone H3 (Ser28) and acquired with Molecular Devices' Discovery-1™ System. Top: control, bottom: 50 ng/mL Nocodazole.

Image Analysis

The Mitotic Index module identifies mitotic cells (green) and interphase cells (red).

Export Data for Further Analysis

EASY CONFIGURATION FOR ANALYSIS

1. Select the nuclear stain image
2. Specify the cell size range
3. Set the intensity above local background
4. Select the mitotic nuclear stain image
5. Set the intensity above local background
6. Optionally choose the reporting parameters

INTERACTIVE DATA DISPLAY

Once the analysis is run, the Cellular Results table allows you to interactively view individual cells' data. Clicking a cell in the image highlights the data for the selected cell in the table.

CUSTOMIZATION THROUGH MACROS

MetaXpress Software is seamlessly integrated with the power and flexibility of MetaMorph® Software and its sophisticated and powerful macros that record and perform a series of tasks without the need for a programming language.

VALIDATED DATA

Development of application modules includes research and testing with a library of in-house and third-party data sets.

MULTI-PARAMETER ANALYSIS

The application module generates a number of field or cell-by-cell parameters, including:

→ Count of mitotic and non-mitotic nuclei
→ Percentage of mitotic and non-mitotic nuclei
→ Total and mean nuclei area of mitotic and non-mitotic cells
→ Wavelength-specific integrated and average intensities of mitotic and non-mitotic nuclei

ORDERING INFORMATION

Mitotic Index Application Module for MetaXpress Software
Part Number: 9500-0036

FOR MORE INFORMATION

For more details, please visit
www.moleculardevices.com/mx

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