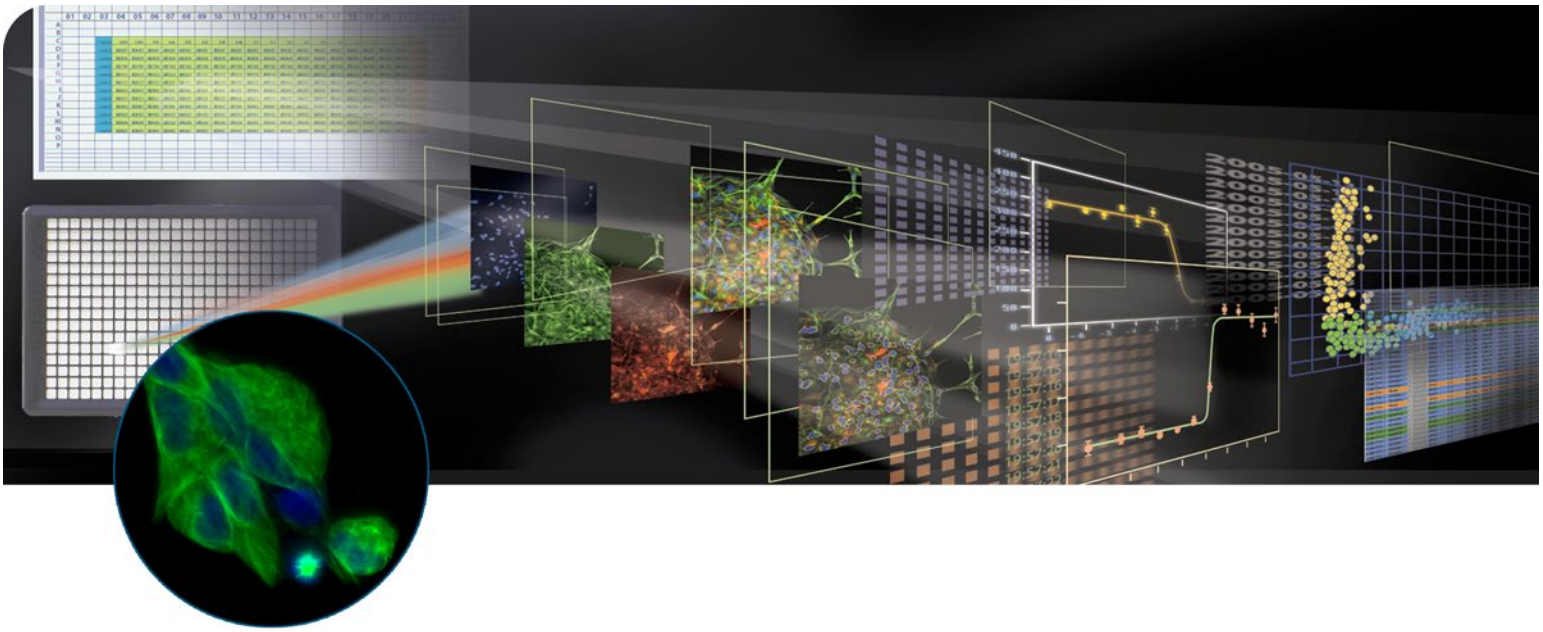
Molecular Devices

MetaXpress Software Monopole Detection Application Module

ANALYSIS SOFTWARE DROP-IN FOR METAXPRESS SOFTWARE



- → QUANTITATION OF MITOTIC CELLS WITH MONOPOLAR OR BIPOLAR SPINDLES
- → ADAPTIVE BACKGROUND CORRECTION FOR IMPROVED SEGMENTATION
- → FIELD AND CELL-BY-CELL DATA LOGGING

Proper formation of a bipolar spindle is vital for the segregation of chromosomes during mitosis. In some serious diseases where cells proliferate uncontrollably, such as cancer, progression through mitosis can be stopped by simply disrupting the normal bipolar spindle formation. Several classical chemotherapy drugs act on microtubules to disrupt the bipolar spindle formation. However, these treatments have side effects in interphase cells.

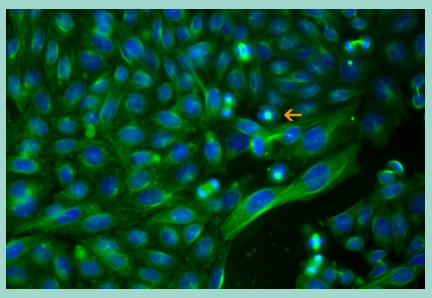
Recently, a new compound named monastrol was found to disrupt spindle formation by affecting centrosome separation. In comparison with microtubule drugs, this effect was specific to mitosis. When the two centrosomes fail to replicate or separate, a monopolar spindle forms instead of a normal bipolar spindle. Other compounds that can produce monopolar spindles are actively being investigated.

The Monopole Detection Application Module for MetaXpress® Software from Molecular Devices is designed for the quantitation of mitotic cells with monopolar or bipolar spindles where cells are labeled with a DNA stain and a second probe for microtubules.

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.

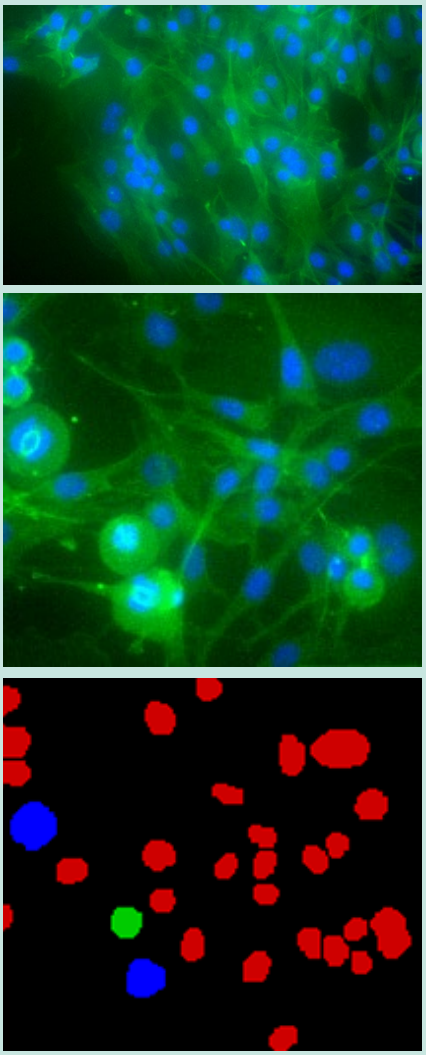
A simple interface minimizes setup efforts and analysis settings can be configured once and saved for future use or customized to fit your experiment.

Multiple Wavelength Acquisition



CHO-K1 cells treated with monastrol and stained with mouse anti-beta tubulin primary antibody detected with a FITC conjugated goat anti-mouse secondary antibody. Nuclei are stained with Hoeschst 33342. Cells were imaged on the Discovery-1™ System from Molecular Devices. Orange arrow shows monopole.

Robust Segmentation and Analysis



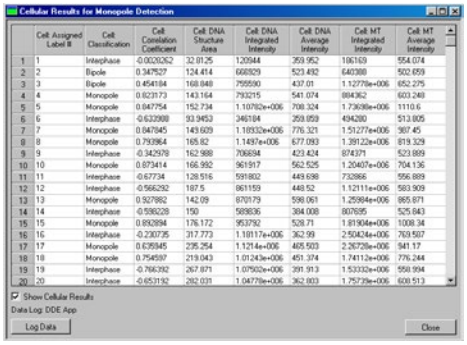
3T3-L1 mouse fibroblast cells treated with monastrol and stained with mouse anti-beta tubulin primary antibody detected with a FITC conjugated goat anti-mouse secondary antibody. Nuclei are stained with Hoeschst 33342. Top: control, middle: monastrol, bottom: segmented image shows interphase cells (red), bipolar spindles (blue) and monopole (green).

CONFIGURATION FOR ANALYSIS

1. Select the DNA stained image
2. Specify the size range of DNA-stained cells and intensity above local background
3. Select the microtubules image
4. Set cell classification limits based on DNA/microtubule staining correlation
5. Optionally set reporting parameters

INTERACTIVE DATA DISPLAY

Once the analysis is run, the Cellular Results table allows you to interactively view an individual cell's 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, called journals, 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.

POWERFUL DATA EXPORT CAPABILITIES

All measurements can be directly exported to ORACLE®, Microsoft® SQL™, text file, Microsoft® Excel® or SciMagix® SIMS™.

MULTI-PARAMETER ANALYSIS

The application module can generate a number of field or cell-by-cell parameters. Field measurements include:

- Count and percentage of monopoles, bipoles and interphase cells
- Area of DNA structures, monopolar, bipolar and interphase cells
- DNA and microtubule average intensities

Cell-by-cell measurements include:

- Cell classification
- Cell correlation coefficient (DNA versus microtubule staining)
- Cell DNA structures area
- Integrated and average intensities of DNA and microtubules

ORDERING INFORMATION

Monopole Detection Application Module for MetaXpress:
Part Number: 9500-0039

SALES OFFICES

- USA & Canada +1-800-635-5577
- Brazil +55-11-3616-6607
- China (Beijing) +86-10-6410-8669
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Molecular Devices

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