

# Neurite Outgrowth Application Module

For MetaXpress High-Content Image Acquisition and Analysis Software

## BENEFITS

- Works with or without fluorescence staining
- Superior segmentation algorithms and adaptive background correction
- Accelerate analysis with MetaXpress PowerCore High-Content Distributed Image Analysis Software
- Run module over timelapse images

Neurite outgrowth is the extension of axonal processes from the cell body and a natural part of development. Inhibition or stimulation of neurite outgrowth is implicated in a broad range of CNS disorders or injuries including stroke, Parkinson's disease, Alzheimer's disease and spinal cord injuries. The Neurite Outgrowth Application Module for MetaXpress® software is designed for the analysis of neurite outgrowth assays. The module helps standardize results compared to traditional methods. Using a nuclear stain is beneficial to identify cell bodies in some cell types. With the flexibility of MetaXpress software, researchers are able to choose whether or not to use nuclear stains. The use of a nuclear stain adds extra assurance in achieving a one-to-one correlation between nuclei and cell bodies.

The module utilizes adaptive background correction, which adapts the detection of features to the local intensity ranges and shape features within and between cells to provide robust segmentation available in an image-based screening system.

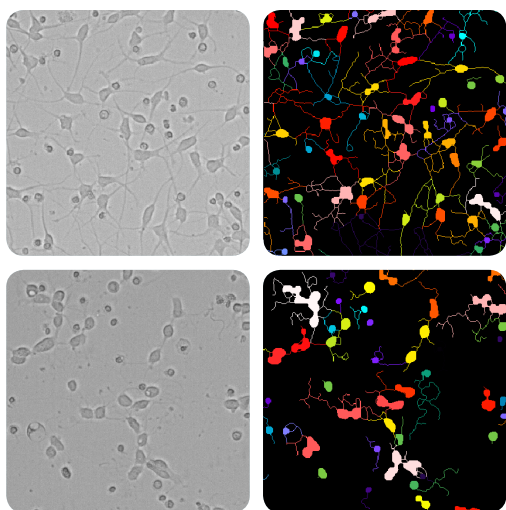
A simple interface minimizes setup efforts. Analysis settings can be configured once and saved for future use or customized to fit a specific experiment.

## Easy configuration for analysis

1. Select the neurite image of interest
2. Specify the illumination (transmitted light or fluorescence)
3. Set the classification limits for cell bodies
4. Select classification limits for optional nuclear stain if desired
5. Choose desired parameters to report

## Interactive data display

Once the analysis is run, the 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 results table.



**Image segmentation.** Untreated neurons (top) have many long outgrowths compared to 10  $\mu$ M Staurosporine-treated (bottom) after overnight acquisition on ImageXpress<sup>®</sup> Micro system using transmitted light. Multi-colored mask shows image segmentation.

## Multi-parameter analysis

Field measurements include, but are not limited to:

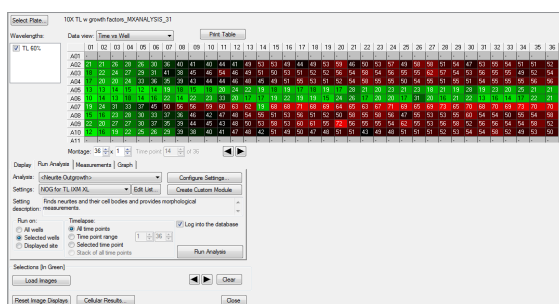
- Total cells, outgrowth, processes, branches, and cell body area
- Mean outgrowth, processes, branches, and cell body area
- Straightness of processes
- Significant growth

Cell-by-cell measurements include, but are not limited to:

- Outgrowth
- Processes
- Mean, median and maximum process length
- Mean outgrowth intensity
- Branches
- Straightness of processes
- Cell body area

## Time-lapse analysis

The Neurite Outgrowth Application Module for MetaXpress software can be applied to analyze images acquired over a time course. Simply setup segmentation parameters and begin analysis on select wells of a plate or batches of multiple plates. The Time vs. Well Data View allows the user to scroll through data per time point per well in a heat map format.



**Time vs. well heatmap.** Change in neurite outgrowth visualized through heat map over 36 time points. A05 and A06 wells contain neurons treated with staurosporine. Other wells contain untreated cells or cells treated with a growth factor.

## Further customization through macros

MetaXpress software and the Neurite Outgrowth Application Module are seamlessly integrated with the flexibility of MetaMorph<sup>®</sup> 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.

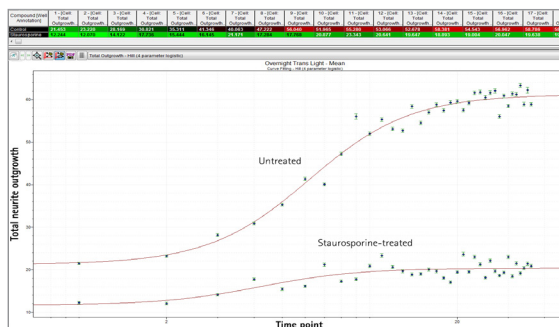
## The fastest workflow from acquisition to hit selection

Image acquisition with ImageXpress automated imaging systems provides the fastest read times for large libraries and great flexibility in acquisition setup for research through screening. On-the-fly cell counting ensures a predefined number of cells is captured and decreases image acquisition times.

Image analysis can be distributed to the high-throughput image analysis platform, MetaXpress PowerCore<sup>™</sup> software, 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<sup>™</sup> software, the data analysis software integrated in our complete imaging solution. AcuityXpress software features an interactive drill down for bidirectional interaction between images and numerical data.

**Data visualization and analysis.** Data visualization with AcuityXpress High-Content Informatics Software. A higher percentage of cells had significant outgrowths on untreated vs. Staurosporine-treated cells.



## Contact Us

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